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CHIEF OFFICES: 42 CANNON STREET, LONDON, E.C.
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 VICTORIA, AND EMPIRE CHAMBERS, YORK STREET,
 SYDNEY, N.S.W.

A Weekly Journal,

supplied from the chief office in London to subscribers and persons connected with the trade only.

Subscription, 10s. per year, payable in advance, including a copy of the DIARY next published, and postage to any country in the world. Single copies, 4d. each.

Cheques and Postal Orders should be made payable to "EDWARD HALSE," and crossed "MARTIN'S BANK (LIMITED)."

As an Official Journal

THE CHEMIST AND DRUGGIST is supplied regularly to every member of the following Societies:—

Pharmaceutical Society of Ireland.
 South African Pharmaceutical Association.
 Pharmaceutical Society of Natal.
 Otago Pharmaceutical Association.
 Pharmaceutical Society of Queensland.
 Pharmaceutical Society of South Australia.
 Pharmaceutical Society of Western Australia.
 Tasmanian Pharmaceutical Society.

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POSTCARD COMPETITION.

ON page 354 of THE CHEMIST AND DRUGGIST, August 31, there is a sketch of a pharmacy interior. We wish our subscribers, their employés, or members of their families to ponder over it; then write us postcards telling us what they think of it. To the person who sends in prose or verse the most appropriate description of the sketch we shall give a prize of a guinea.

**THE CHEMISTS' AND DRUGGISTS'
 DIARY, 1895.**

THIS work is now in course of preparation, and the publisher is booking advertisement orders for it. It will have a larger circulation than any previous Diary, and the contents will, we hope, surpass all that has been done before.

Summary.

BRIGHTON and Cambridge chemists picniced last week (p. 371).

ANALYSES of several brands of condensed milk are mentioned on p. 369.

THE granting and refusal of more wine licences for chemists are noted on pp. 370-1.

A SMETHWICK CHEMIST has been censured by a Coroner for an irregular sale of vermic-killer (p. 370).

AN unqualified assistant in a Leith drug-store has to answer a summons for selling poisons (p. 406).

ARGON and helium have been found in the gas evolved by the water of a mineral spring in the Pyrenees (p. 373).

THE need of more systematic instruction of aprentices is advocated by Mr. H. Wilson in a letter on page 413

AS many of those who analysed our chemical sample last month mistook manganese for magnesia, Mr. Moss gives some hints on the matter (p. 368.)

A CORRESPONDENT gives some particulars regarding the Minor examination which will interest students and those who have remarked recent heavy failures (p. 413).

THE British Association will meet at Ipswich next week. The Chemistry and Physic sections have arranged two interesting discussions, but the chemistry programme otherwise is not very attractive (p. 369).

LORD LANSDOWNE has received a deputation regarding the enterprise of the Dover Artillery Canteen, who manufacture aerated waters and supply other regiments. Lord Lansdowne is not disposed to discourage the artillerymen (p. 369).

WE report a sad poisoning case of a doctor's child, who swallowed a teaspoonful of belladonna liniment and died a few hours after. The liniment had been supplied by the family medical adviser and was not labelled "Poison" (p. 371).

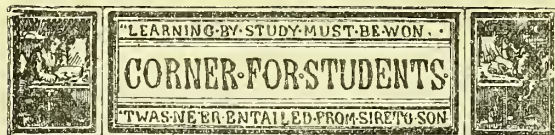
A WEEK or two ago we reported a case is regard to self-raising flour. The analyst declared that there was alum in it. Dr. Dyer insisted there was none, and now the Somerset House chemists corroborate Dr. Dyer. The matter is not to be allowed to end here (p. 406).

WE report the earlier part of the proceedings of the American Pharmaceutical Association held at Denver. The topics of chief interest were the preliminary education of druggists and the proprietary-medicine question. A lady has been appointed one of the vice-presidents of the association, and we are able to give her portrait (p. 374).

WE report several interesting adulteration cases this week. In two cases the question as to whether yellow wax is a drug or not was discussed before the Magistrates, who, however, inflicted a nominal fine. In the third case a Sevenoaks pharmacist was summoned for selling sp. æther nit. P.L. for sweet spirits of nitre, and he succeeded in showing the Magistrates that he was right (p. 406).

THE report of the Commissioners of Inland Revenue which has been issued this week is commented upon. The most noteworthy feature of the report is that the great fall in the consumption of patent medicines, which we had occasion these past two years to comment upon, has stopped, and the increased revenue from medicine stamps shows that in 1894 and 1895 several million 13½d. packages more had been consumed than in the year previous (p. 403).

WE give very full information in this number regarding all departments of education connected with pharmacy. There is much information, including appointments and honours to chemists and medical men. We append, along with the educational matter, engravings of two of the Pharmaceutical Society's examination rooms and two pages of sketches of British schools of pharmacy. We also contrast with the latter the style of the American Colleges, illustrating it with the Philadelphia College and an account of the curriculum obtaining thereat (p. 375).



CONDUCTED BY RICHARD J. MOSS, F.C.S., F.I.C.

QUALITATIVE ANALYSIS.

A MIXTURE of not more than three salts will form the subject of the next exercise in qualitative analysis. The mixture is to be submitted to a thorough systematic examination, all its constituents are to be detected, and proof is to be given that the substances detected are the only constituents of the mixture.

Students' applications for portions of the mixture of salts (accompanied by a stamped and addressed envelope, not a stamp merely) will be received up to Wednesday, September 11, and the samples will be forwarded immediately.

Students' reports will be received up to Saturday, September 28. Each report should contain a concise account of the work done, and should include a list of the constituents detected. In this list any substance regarded as an accidental impurity should be distinguished from the essential constituents of the salts composing the mixture.

REPORTS.

The subject of the last exercise consisted of 3 parts of zinc sulphate, 1 part of ferrous sulphate, and 1 part of manganese sulphate. Its calculated composition was—

Fe	..	..	..	..	..	4.03
Mn	..	..	..	..	..	4.56
Zn	..	..	..	..	..	13.59
SO ₄	..	..	..	..	..	34.94
H ₂ O	..	..	..	..	..	42.88
						100.00

Portions of the mixture of salts for analysis were sent to 56 applicants, but we received only 18 reports of the work done. This is the smallest number of reports received for some time. The analysis was not difficult enough to account for the falling-off; it is very likely that the holidays are mainly responsible for it. Seven of our correspondents failed to detect manganese, and three failed to detect zinc. In the case of iron there was only one failure, though it was present in smaller quantity than the manganese. The sulphuric radicle was detected in every case.

Most of the errors in the reports before us arose from one cause—the use of certain reagents in insufficient quantity. Almost every student who failed to detect manganese reported magnesium present. The reason of this is simple enough; the manganese should have been precipitated as sulphide along with the zinc and the iron. In fact, all the metallic constituents of the mixture should have been precipitated together by means of ammonium sulphide in the presence of ammonium hydrate and chloride. For this purpose a good deal of the sulphide was required, and there was nothing to indicate directly whether a sufficiency of the reagent had been employed. The safest plan under such circumstances is to filter off a portion of the liquid, and to add to this filtrate a few drops of the solution of ammonium sulphide. If there is no further precipitate it follows that a sufficiency of the reagent had already been used; but if there is a further precipitate more ammonium sulphide must be added to the liquid and the test again repeated. The expert may be able to dispense with this precaution, because the smell of the liquid, and its colour

when the precipitate subsides, as well as the colour of the precipitate, may sufficiently indicate that the proper quantity of the reagent has been used; but for the beginner it is always safest to adopt the more indirect method, and to avoid the possibility of error. These remarks do not apply to any one group reagent, but to all cases in which it is desired to effect the complete separation of any substance by means of precipitation.

The manganese left in solution through imperfect precipitation did not make its appearance until sodium phosphate was added for the purpose of detecting any magnesium that might have been present. The somewhat granular-looking precipitate of manganese phosphate that was produced was then mistaken for ammonio-magnesium phosphate. The latter error was scarcely excusable because the magnesium compound always assumes a distinctly crystalline form; when the precipitate forms slowly the acicular shape of the crystals is very characteristic.

The separation of the metals, iron, manganese, and zinc, was best effected by the barium-carbonate method; the attempt to separate iron and manganese by means of the alkalis is rarely successful.

PRIZES.

The First Prize for the best analysis has been awarded to HERBERT BRIDGES, care of Messrs. Nuthall & Mason, Bank Plain, Norwich.

The Second Prize has been awarded to

JOHN G. MORRELL, care of Mr. H. H. Taylor, Cleveland Dispensary, Middlesborough.

MARKS AWARDED FOR ANALYSES.

Herbert Bridges (1st prize)	..	100	Canny Scot	..	..	80
J. G. Morrell (2nd prize)	..	98	W. O. Pickering	..	..	78
Ammonium Isolator	..	96	Per Ardua	..	..	77
J. B. Fancourt	..	96	Jay Ell	..	..	76
Cumbria	..	95	Diatom	..	..	75
001	..	94	Tarn	..	..	55
Forceps	..	93	Quercus	..	..	50
Hopeful	..	90	Narcissus	..	..	40
Demosthenes	..	82	Chaut d'Amour	..	..	35

TO CORRESPONDENTS.

Prizes.—The students to whom prizes are awarded are requested to write at once to the Publisher, naming the book they select, and stating how they wish it forwarded.

Any scientific book that is published at a price not greatly exceeding half a guinea may be taken as a first prize.

Any scientific book which is sold for about five shillings may be taken as second prize.

Note.—All communications should include the names and addresses of the writers.

HOPEFUL.—You did not add sufficient ammonium sulphide to completely precipitate the manganese and zinc. On adding ammonium carbonate to the filtrate there was no precipitate, but with sodium phosphate a white precipitate consisting of manganous phosphate was thrown down, and you mistook it for ammonio-magnesium phosphate.

DEMOSTHENES.—It is desirable to detect manganese in the preliminary examination when that metal is present. In the examination of a substance in the wet way a small quantity of manganese is easily overlooked. After heating a portion of the powder in a bulb tube you had a residue left, part of which might have been used in testing for manganese and chromium, by fusing it with sodium carbonate and nitrate. A minute portion of this residue was sufficient to impart a green tint to a considerable mass of sodium carbonate.

CANNY SCOT.—It is almost impossible to prepare a salt quite free from sodium. You must distinguish between the evanescent flame-coloration due to the usual traces of sodium and the brilliant and persistent yellow colour imparted to the flame when a salt of sodium is present even in small quantity.

W. O. PICKERING.—You should have made a more exhaustive preliminary examination of the powder before you prepared a solution and applied the group reagents. A few judicious blowpipe tests often give a great deal of information at the cost of very little time and material. Without the aid of the spectroscope it is not safe to rely upon flame-coloration for the detection of potassium. The platinum-chloride test should be applied. With proper care it is a very sensitive test.

PER ARBUT.—It was evident that you precipitated only a small part of the zinc and manganese as sulphides, and that the precipitate you subsequently obtained with sodium phosphate was due to these metals, and not to magnesium. On filtering off the sulphides you should have added ammonium sulphide to the filtrate to make sure that a sufficiency of the reagent had been employed.

JAY ELL.—It is very probable that the greater part of the manganese was precipitated along with the ferric hydrate that you obtained on adding ammonia to the solution of the precipitated sulphides. Owing to the risk of overlooking manganese at this stage of the analysis, it is important to test for that metal in the preliminary examination. See remarks to "Demosthenes."

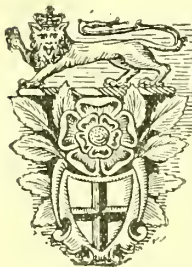
DIATOM.—It does not appear from your report that you oxidised the ferrous salt before adding ammonia as a group reagent; this would account for the comparatively small quantity of iron you detected. The alkaline carbonate with which the precipitated hydrates were fused may have contained aluminium; it is sometimes present in such salts in notable quantity.

TARN.—You made no attempt to isolate the constituents of the black precipitate produced by ammonium hydrate and sulphide in the presence of ammonium chloride. This should have been one of the chief objects of your work; it is difficult to identify any metal satisfactorily until it has been separated from every substance that can interfere with its reactions. The white precipitate you obtained with silver nitrate was silver sulphate.

QUERCUS.—You were scarcely justified in reporting oxalic acid present on such slender evidence; if it had been a constituent of the mixture a solution of the powder acidulated with acetic acid would have given a precipitate with a soluble calcium salt, but no such reaction took place.

NARCISSUS.—In using ammonia as a group reagent you did not add a sufficient excess to dissolve the zinc hydrate, consequently most of it was precipitated along with the ferric hydrate. The zinc remaining in solution was not precipitated by sulphuretted hydrogen, because the solution was not sufficiently alkaline. You should pay special attention to the use of your reagents in proper quantity.

CHANT D'AMOUR.—You forgot to oxidise the ferrous salt before adding ammonia, hence the almost white precipitate at first obtained with that reagent. It was the oxidation of the ferrous hydrate in this precipitate that caused the green colour you observed, and not the presence of chromium. The aqueous solution of the powder was acid to litmus-paper even after warming, so that a carbonate could not have been present.



English News

The Editor is obliged to correspondents who send local newspapers containing items of interest to the trade. He will be further obliged if such paragraphs be marked in all cases.

Military Mineral Waters.

As a sequel to their protest reported in our last issue, a deputation from the Kent and Sussex Association of Mineral Water Manufacturers and Ale and Porter Bottlers' Trade Protection Society (Limited) waited on Friday afternoon upon Lord Lansdowne, at the War Office, to draw his attention to the action of the Royal Artillery canteen at Dover in supplying other regiments with aerated waters. Mr. G. Wyndham, M.P., introduced the delegates, whose cause was advocated by Mr. P. W. J. Mackenzie, president of the Association, and others. It was urged that no fewer than 100,000 men are employed in, and that 2,000,000 of capital is represented by this branch of industry; and the speakers contended it was unfair for *bona fide* manufacturers who had capital invested for the supply of the troops, and who had to pay rent, rates, wages, and Imperial taxes, to have their trade injured by the competition of men belonging to the army. It was asserted that not only had the president of the mess written to the commanding officers of the infantry in Dover with reference to the proposal of the Royal Artillery canteen, but that there was reason for believing efforts were being made to secure the custom of regiments abroad, who would soon be taking up their quarters in the town. It was further stated that the Engineers' canteen at Chatham was following in the same lines. Lord Lansdowne promised that full inquiry should be made into the matter, but stated that he did not feel inclined

to discourage the canteen system; and he added that there was nothing in the present regulations to prevent one canteen from supplying another. He was surprised to learn that the mineral-water industry was so extensive as had been pointed out that day. The deputation thanked Lord Lansdowne for giving them an interview, and then withdrew.

Bradford Chemists are Uniting.

It is proposed to form a Chemists' Association at Bradford. The first meeting was held in the Church Institute on Wednesday evening, August 28, Mr. Rimmington presiding, when a committee was appointed to draw up rules, and the members of the committee were to meet on Thursday. There is, we understand, a fair prospect of a good association.

How S.-W. Bottles Disappear.

Messrs. Tunbridge & Co., chemists, Castle Street, and Broad Street, Reading, have for years past missed large quantities of aerated-water bottles, which they have not been able to trace until recently. During the past few weeks Thomas Weaver, a local mineral-water manufacturer, has been before the Reading Magistrates on a charge of stealing boxes and bottles, amongst which were some belonging to Messrs. Tunbridge & Co. Mr. C. Strong, of the firm, stated in his evidence the other day that he saw between two and three tons of broken glass, much of which belonged to his firm, at the prisoner's house, it being buried there. According to other evidence the prisoner instructed his men positively to plane off Messrs. Tunbridge's name, and substitute his own on the boxes; this was done in a number of instances. Some bottles belonging to Mr. Knowles, chemist, Reading, were also found at the prisoner's premises. He was committed for trial at the Quarter Sessions with rather heavy bail.

The Wine Did It.

Guildford Dudley North, the young chemist who was charged at Hull with an indecent assault on a girl 12 years old, as reported in our issue of August 24, was brought up again on Thursday, August 29, when the deputy chief-constable asked the charge to be altered to one of common assault. Dr. Jackson said that North would plead guilty to a charge of common assault. It was attributable to prisoner having taken a few glasses of port wine. Defendant was fined 5*l.* and costs, or in default thirty days.

The Shadow for the Substance.

At a meeting of the Liverpool Health Committee last week, Dr. Hope, the Medical Officer of Health, reported that he caused samples of each of the brands at present on the market in Liverpool to be purchased for analysis, and the appended list indicated the names of the brands and the percentage of fat in each:—Tip-top brand, 11.19 per cent. fat; Nestlé's, 10.97; Ideal Milk, 10.25; Anglo-Swiss (Dairymaid), 9.33; Mother brand, 8.12; Popular, 4.15; Shamrock, 2.73; Dairy, 1.70; Calf, 1.42; Cup, 0.91. In reply to Mr. Purcell, Dr. Hope said that no action could be taken against the manufacturers of the skimmed-milk stuff because the tins were very ingeniously labelled. They did contain a certain proportion of milk, but a great deal of the cream had been removed. In the same way there were preparations called egg-powders sold, and a certain class of people gave these powders to their children under the impression that they were using the equivalent of eggs. Similarly they used these condensed milks under the impression that it was milk. As a matter of fact, it was nothing of the sort. Mr. Taggart: Are the preparations injurious to health? Dr. Hope: It is a perfectly harmless preparation, but it contains no nutriment. If people will read what is written on the tins they will be able to discriminate between what is good and what is bad.

Thefts from a Branch P.O. Pharmacy.

At the Liverpool Police Court on Friday, August 30, Arthur Hughes (16), Elizabeth Hughes (55), and Thomas Hughes (30), were charged, the lad with having stolen, and the others with having received knowing them to have been stolen, ninety postal-letters, containing cheques to the value of 1,605*l.* 13*s.* 7*d.*, as also a quantity of medicines. The younger prisoner was an errand-boy in the employment of Mr. John Lewis Jones, chemist, Mill Street, who is also

master of a branch post office in connection with his shop. The other prisoners are the lad's mother and brother. A firm posted ninety letters, twelve of which contained cheques to the value of 1,605/13s. 7d., and as the letters were not delivered, inquiries were made by Detective-sergeant Jackson, whom the lad told that he had stolen the letters for the sake of the postage-stamps upon them, which he had removed from the letters, burning the latter and their contents. Several of the stamps the officer found in the prisoner's house, along with a quantity of medicines which the youth said he had taken to doctor his mother, who was unwell. The prisoners were remanded.

A Chemist Censured.

At an inquest held at Smethwick last week regarding the death of a young woman, who had taken a mixture of ammonium sulpho-cyanide and cyanide of potassium, and vermin-killer, Dr. A. Jackson stated that the mixture would cause instant death. Mr. Eardley Reed, chemist and druggist, Rolfe Street, Smethwick, said that on June 5 he supplied deceased with vermin-killer, after taking the necessary precautions. In reply to the Coroner, witness said he did not enter the date in the book at the time the purchase was made, but he had been convinced that deceased visited his shop on June 5 by a woman named Hudson, who witnessed the purchase. The Coroner, in summing up, said he was sorry that Mr. Reed had neglected to enter the date in the book, which was a very serious matter. Such a book ought to be kept in a more uniform state, and he advised him in the future to adopt a different course. He reminded the jury that the sale of poison to deceased had not been carried out in accordance with the Act of Parliament. The jury returned a verdict to the effect that deceased committed suicide whilst temporarily insane, and recommended the Coroner to censure the chemist for the manner in which his books were kept, which was accordingly done.

Foreign Parcels Posts.

On Saturday a Parcel Post Convention between Great Britain and France was gazetted in Paris.

In the House of Commons on Friday Mr. Hanbury stated, in reply to a question, that the Post office is endeavouring to see whether it is possible to establish a parcels post with the United States, but the difficulty is that the carriage of parcels in the United States is to a great extent in the hands of great carrying companies.

British Association.

The British Association meeting at Ipswich will be opened on Wednesday, September 11, when Sir Douglas Galton will succeed Lord Salisbury as President. The work of the meeting promises to be good. Professor Meldola, the President of the Chemistry Section, proposes in his address to treat of the state of chemistry at the time of the last meeting of the Association at Ipswich (1851), as compared with its present position, and to review the development of structural or constitutional chemistry with special reference to the synthesis of products of animal and vegetable origin, and the bearing of these results on the problem of vital chemistry. Reference will also be made to the recent discoveries of new gaseous elements. The preparations for the general work of the section are in a backward state, but on Friday, September 13, there is to be a joint meeting with the Physics Section, at 10.30 A.M., for the consideration of two special subjects. The first of them will be a discussion on the evidence to be gathered as to the simple or compound character of a gas from the constitution of its spectrum. The discussion will be opened by Professor A. Schuster, on the physical side. Others taking part in the discussion will be Lord Rayleigh and Mr. W. Crookes. The other subject for joint discussion will be "Orthochromatic Photography." Captain W. de W. Abney and Mr. C. H. Bothamley will read papers on the subject, and a short discussion is expected to follow.

A Bad Use for the Corn-cure.

A Tylorstown collier named Redmond Clary, whose wife had just died, leaving him with the care of eight young children, attempted to commit suicide by taking Monday's corn-viridine. Fortunately his groans attracted the attention of his daughter, and she gave information to a policeman, who administered an emetic, and the man recovered.

Holloway's Millions.

The death of Sir George Martin Holloway, says the *Brighton Argus*, will not stop, but render more complicated the disputes as to the succession to the great riches left by the old pill-and-ointment millionaire of New Oxford Street. The deceased knight, who was in his 62nd year, was married to the sister of the late Mrs. Thomas Holloway, and received his title on the occasion of the opening of the Royal Holloway College by the Queen in 1886. It will be remembered that Mr. William H. Young, a son of the original pillman's sister, brought an action to set aside the will under which Sir G. M. Holloway and others succeeded to the estate, alleging forgery and fraud. The case was fought at every step, and the defendants at one stage applied to the Court to strike out the action. Sir Francis Jeune, in the Probate Division, refused to do this, and the case is in the list for hearing soon after the Long Vacation. The death of Sir G. M. Holloway has made it necessary for Mr. Young to oppose probate of his will, and his solicitors have already entered the necessary caveat at Somerset House with that object.

The Abortives Case.

On Friday Mr. C. Luxmoore Drew, the West London coroner, concluded his inquiry regarding the death of Mrs. Minnie Friedly, aged 22 years, an actor's wife, the jury finding that death was due to a severe internal rupture, resulting in hemorrhage.

Prussiate Poisoning is Rare.

At Bootle, last week, a young man of about 19 was taken to the Borough Hospital suffering from prussiate of potash poisoning. It appears that he was found in his bedroom lying on the floor in an unconscious condition. Dr. Wild, on seeing the youth, saw that he was suffering from the effects of some poison, and after using the stomach-pump with good effect, the doctor sent the fellow to the hospital, where he was soon able to sit up in bed. He admitted having taken a dose of the prussiate to do away with himself.

Another Doctor takes Prussic Acid.

Dr. William Hickman (47) was found dead in his room at 3 Myrtle Cottages, Upper Caterham, on Tuesday last week. The evidence at the inquest, held by Mr. Braxton Hicks, showed that the deceased in March last came from Wales. He had a fairly good practice at first, and seemed in good spirits; but about a month ago his landlady noticed a change in him, and at times he seemed very much worried and complained of his head. He had latterly been taking sleeping draughts. He was not a temperate man, and sometimes took more than was good for him. Police-constable Matthews stated that on the mantelpiece was a 1-oz. bottle half-full of prussic acid. Dr. Hillyer stated that death was undoubtedly due to poisoning by prussic acid. The Coroner said deceased had evidently let himself down, and lost his practice. Why he left Wales there was no evidence to show, as his sister, who had been written to, had not replied as yet. The jury returned a verdict in accordance with the medical evidence.

Wine-licences.

The following have obtained licences for the sale of medicated wines since our last report:—

- Mr. Frank Mays, chemist, Friar Street, Reading.
- Mr. William Wyatt, chemist, 34 New Street, Lancaster.
- Mr. Arthur John Codling, chemist, Cheltenham.
- Messrs. Michael Beetham and William Charles Beetham, chemists and druggists, Promenade, Cheltenham.
- Mr. Hugh Russell Biott, chemist, Irthlingborough, Wellingborough.
- Mr. Charles Harry Fryer, chemist, Pier Terrace, London Road, South Lowestoft.
- Mr. W. V. Meacham, chemist, High Street, Ledbury.
- Mr. Joseph Arthur Jessop, chemist, Hadfield.
- Mr. David Hunter Oxen (Oxen & Co., Limited), chemist, 40 Bridge Street, Newcastle, Staffordshire.
- Mr. Gadd, chemist, Fore Street, Exeter.
- Mr. J. Wippell, chemist, Fore Street, Exeter.
- Messrs. Hickman & Metcalf, chemists, Newbury.
- Mr. Frank Hazlitt, chemist, Market Street, Heywood.
- Mr. W. H. Bucher, chemist, Truro.

Mr. James Tomlinson, chemist, Chelmsford.

Mr. Wm. Bouchier, managing director of the Eastover Stores Association (Limited), Bridgwater, applied at the Brewster Sessions for a wine-licence, and undertook to sell only medicated wines. The application was opposed by Mr. C. E. Hagon, solicitor, on behalf of the Licensed Victuallers' Association, and by Mr. W. T. Baker, on behalf of Messrs. Starkey, Knight & Co. Mr. Bouchier was examined by Mr. Hagon, and stated that he was not a registered qualified chemist, and that there had been some irregularities at the Stores respecting the sale of poison. He also stated that a nominal penalty had been imposed by the Inland Revenue for selling medicated wines without a licence. The Bench did not hold the points raised by the opposition as respecting character as being good, and granted the licence.

The application at Bootle Brewster Sessions of Mr. J. Short, chemist and druggist, Millom, was opposed by all the temperance bodies of the town. Mr. Dickinson stated that his client had frequent calls for meat and malt wine and coca-wine. In making application to the Bench the fees were about 2*l.* 10*s.*, but to apply through the Excise the fees were about 10*l.* Questioned, Mr. Short stated that if he was granted the licence he was entitled to sell any kinds of wine, but it was not necessarily a fact that he was about to take such an agency as Gilbey's. It was submitted that the licence was not required, and that the formalities had not been carried out. The Bench upheld the latter contention, and refused the application.

An open-air meeting was held at Aspatria to protest against the application of a wines, spirits, and liquor licence by Mr. Spark, chemist and druggist. The speakers stated that such a licence was not required, and it was decided to use all legitimate means to prevent the granting of the application, and a petition to the Magistrates was signed by many of those present.

Mr. William Highley, chemist, Drake Street, Rochdale, was refused a licence at the Rochdale Licensing Sessions.

A Beer-licence Refused.

At Ossett Brewster Sessions, Mr. J. W. Cussons, chemist and druggist, Ossett, applied for a licence to sell beer by retail "off the premises." It was stated that the licence was only for the sale of bottled beer and stout, but the Bench refused to grant it.

A Large Order.

Last week much interest was caused at Bolton by a large consignment of goods to Messrs. Wm. Green & Co. (Limited), Deansgate. The goods consisted of 200 hampers of Coleman's Wincarnis, weighing 8 tons 12 cwt., and valued at 567*l.* Two loads of coffee and 1 ton of Ceylon tea were delivered at the same time.

Drug-contract.

Sheffield chemists and druggists have this week been invited to tender for the supply of drugs and sundries required by the Union during the ensuing six months. They are asked to state what discount they will allow from the wholesale drug and sundries' list of Messrs. Evans, Lescher & Webb and Messrs. S. Maw, Son & Thompson, respectively.

A Coroner on Infant Feeding.

Mr. Sydney Smelt, the Deputy-Coroner for Manchester, held an inquest on Friday concerning the death of a child, aged three months. From the evidence it appeared that the child, which had died from convulsions, had been fed chiefly on Mellin's and Neeve's foods, and milk and rusks. The Deputy-Coroner, in addressing the jury, made some strong remarks anent the feeding of the child, and said that all such patent preparations for babies were unnatural, and it was a bad thing to give young infants such unnatural foods. It occurred to a very great extent with ignorant mothers among the working-classes. A circular, containing a lot of excellent advice on the subject, had been issued by Dr. Niven, the Medical Officer of Health, and he would recommend all young mothers to study it. The jury returned a verdict of death from natural causes.

Not Customary to Label Lin. Belladon. "Poison."

Last week a child of two years, son of Dr. Harris, of Thurnham, drank from a bottle in mistake for water a quan-

tity of belladonna liniment, which had been sent for his sister's use by Dr. Meredith, Maidstone. The child died, and at the inquest Dr. Harris said that when he returned home from visiting he was told that his son had drunk the liniment, and that he had been conveyed to the surgery of Dr. Boyce, at Maidstone. He at once drove to Dr. Boyce's, where he found the deceased. As Dr. Boyce was not in, he at once conveyed the child to the hospital. Deceased had drank about a drachm of liniment. Henrietta Harris, aged 14, and Mrs. Emily Charlotte Harris also gave evidence, and were followed by Mr. Alexander Story St. John, M.R.C.S., L.R.C.P., the West Kent Hospital *locum-tenens*, who stated that tracheotomy was performed by Dr. Knowles, because the child's breathing was most difficult. The immediate cause of death was convulsions following the taking of belladonna. Dr. Meredith, Maidstone, stated that he prescribed for Dr. Harris's daughter 4 oz. of belladonna liniment. Coroner: Did you place a red label containing the word "Poison" on the bottle?—No; there were the words on the bottle "Not to be taken." Is it not the custom to affix to a bottle containing belladonna a red label bearing the word "Poison"?—No; I don't think so. There was a red label on this bottle, but it did not have on it the word "Poison." Some patients when they see a bottle containing liniment labelled "Poison" are afraid to use it. The jury returned a verdict of accidental death.

Chemists' Picnics.

Brighton chemists and their friends held their annual outing on Thursday, August 29. The party, numbering about forty, left Brighton by the 10.13 train for Tunbridge Wells, whence they were conveyed in brakes, *via* Southborough, to Penshurst. Here, after light refreshments at the Leicester Arms, a very interesting hour was spent in visiting the church, the park, and the castle. "Penshurst Place," as the historic mansion is called, is the home of the Sidneys, and the present owner, Lord de L'Isle, has spared no pains in preserving the old place in its original form. The baron's hall, or banqueting room, dating from the fourteenth century, is especially worthy of note. Some fine portraits, valuable curios, and Elizabethan relics are to be found in the various rooms. The drive back to the Wells was by way of Langton and Rusthall. Ample justice was done to a substantial luncheon served at the Swan Hotel, during which votes of thanks were passed to the energetic secretaries, Messrs. Savage and Yates, and to the chairman of the Pharmacy Association, Mr. W. H. Gibson. A visit was next paid to the celebrated High Rocks, before leaving which an *al fresco* tea was provided, and a photographic group taken. A promenade on the pantiles finished up the evening, and the party reached home about 11 o'clock.

Between thirty and forty members and friends of the Cambridge Pharmaceutical Association had an outing on Thursday, August 29. They journeyed to Hunstanton, reaching it about 4.30. While some enjoyed the luxury of a dip in the sea others had the various strata and rock-formations explained to them by Mr. Keeping, the curator of the Geological Museum, who was one of the party, and those who went on a botanical search were rewarded with some good finds. About 7 o'clock they all met at Roberts' Hotel for tea, the remainder of the evening being spent in strolling about the beach and pier. Home was reached about 10.30.

Carbolic-acid Poisoning.

An inquest was held at Carlisle, on Wednesday, August 28, regarding the death of Elizabeth Bowness (25), who committed suicide by drinking a quantity of carbolic acid that morning. Mr. Peter Simpson, chemist, Denton Street, deposed that deceased came to his shop between 10 and 11 and asked for carbolic acid for cleaning purposes. He supplied her with half-a-pint, and placed a poison label on it as usual. It was not one of the poisons that was required to be kept behind a wire screen. There was no law about it; anyone could sell it, even a person who was not a chemist, and in any quantity. Dr. Sullivan testified that deceased must have drunk about 3 oz. Even if he had been in the house he could not have saved her, because enough poison would have adhered to the lips, throat, tongue, gullet, and stomach to cause death. A verdict was returned accordingly.

He took the Liniment Intentionally.

Dr. G. Danford Thomas, the North London Coroner, has held an inquest regarding the death of Worthy Rich (61), a chapel-keeper, who on Saturday last took a fatal draught of aconite and camphor liniment. He seems to have got the poison from the surgery of the mission to which he was attached.

Store Prices.

The Civil Service Supply Association (Limited) announce the following reductions in prices:—Cott's acetic acid, from 1s. 6½d. to 1s. 6d. per bottle; Koko hair-wash, from 2s. to 1s. 10d. per bottle; lemon kali, from 6½d. to 6d. per lb. tin; lozenges, gastric antacid (Sir William Roberts'), from 2s. 3d. to 2s. 2d. per lb.; Pepper's quinine and iron tonic, from 3s. to 2s. 11d.

Arrested by the Tipstaff.

At the London South-western Police Court, on Wednesday, William Stewart Dickson, formerly of Bright's Pure Drug-Company, Clapham, was charged on remand with breaking into the Company's premises as reported in our last issue. The accused now denied any felonious intention, and said he went to the shop as owner of 550 shares, believing that the Official Receiver had taken sufficient money to pay the debenture-holders. Mr. Lane did not think the prisoner had any felonious intention. He suggested that the prisoner should be dealt with under the warrant granted by Mr. Justice Kekewich. He discharged the prisoner, who was at once arrested by the tipstaff.



Irish News

The Editor is obliged to correspondents who send local newspapers containing items of interest to the trade. He will be further obliged if such paragraphs be marked in all cases.

Dublin Improvements

Messrs. Kinslagh's pharmacy, Grafton Street, is undergoing extensive external alterations. Messrs. Johnston & Oldham's Medical Hall, in the same street, is likewise in the hands of the contractor. Mr. Spencer's new drug concern in Mary Street is rapidly approaching completion, and will be shortly opened under the management of its proprietor.

They are Beginning.

A meeting of the Pharmaceutical Chemists' and Apothecaries' Assistants' Association was held on Friday last at the N.L. Cafe, 84 Grafton Street, Mr. J. S. Corcoran, L.P.S.I., in the chair. Messrs. Long and Alister were unable to be present, although they were the principal speakers in the debate, "Is a new edition of the British Pharmacopoeia necessary." It was resolved to adjourn the meeting until Friday, September 6.

A Water War.

The Guardians of the South Dublin Union refuse to pay for the water used in the dispensary for the preparation of drugs and medicines, on the ground that charitable institutions are exempt from water-rates, and that the water is neither used for trade purposes nor for sale. The claim is made by the Corporation because of special taps being used in the laboratory. Both sides are firm, and there is a strong probability of the case going to law.

Colour-photography Pays.

Professor John Joly, F.R.C., of Dublin, who recently discovered the process of colour-photography, has sold the right to the system in the United States and Canada for 6,000l.

Death of an Octogenarian.

Dr. Edward M. Gleeson, J.P., one of the oldest, if not the oldest, apothecaries in Ireland, passed away last week at the

ripe age of 81 years. The deceased carried on a lucrative business in Westmeath for a number of years past.

Drug-contracts.

Nine years ago the annual cost of drugs to the Ballinrobe Union was 79l., to-day it is 274l. An explanation has been asked for as to the increase.

Messrs. Boileau & Boyd, wholesale chemists, Dublin, have been appointed contractors for the supply of drugs and medicines to the Mayor Asylum, Castlebar.

Tenders for drugs and medicines are invited by the following poor-law boards, on or before the dates given:—Irvinestown Union and dispensaries, September 18; Lurgan Union and seven dispensaries, September 12; Navan Union, September 11. The usual contract regulations obtain.

The Board of Guardians of Dungannon have accepted the tender of Mr. J. Netheby, pharmaceutical chemist of that town, for the supply of medicines and medical and surgical appliances. Tenders had also been sent in by the Apothecaries' Hall, Leslie & Co., and Boileau & Boyd, Dublin, John Clark & Co., Belfast, and Harrington & Son, Cork.

In selecting, last week, the tenders for drugs and medicines to the local asylum at Castlebar, the Guardians adopted the following plan:—Selections were made on the samples before the tenders were opened. Each sample bore a letter, a number, and the price of the drug, but without the name of the contractor tendering. With the unopened tender were enclosed sealed envelopes bearing some particulars outside, and after the selections were made on the samples the tenders were opened, and from the envelopes enclosed and endorsed as were the samples, the name of the contractor was given and entered on the sheet.



Scotch News

The Editor is obliged to correspondents who send local newspapers containing items of interest to the trade. He will be further obliged if such paragraphs be marked in all cases.

New Shop.

Mr. Robert Carruthers, chemist, High Street, Dumfries, has just finished the construction of his handsome new shop. The outer walls have been faced entirely with enamelled tiles in rich warm brown and olive green, formed into panels between bold pillars and cornices of painted marble. The effect is very good. The warehouses connected with the establishment, which a short time ago were destroyed by fire, have been remodelled and furnished and are most conveniently arranged.

Smoke-consuming Apparatus.

A trial has just been made at the Edinburgh Infirmary of a smoke-consuming apparatus, patented by Mr. William McGlashan, engineer, Leith. The apparatus is a simple but effective method of consuming smoke in the flues before it can reach the chimney, and it can be applied to existing boilers without any alterations. The essential feature of it is that a jet of crude petroleum is carried to the ashpit, where it mixes with air, and in conjunction with the smoke and waste gases, bursts into flame and the smoke is consumed.

British Dental Association.

The annual meeting of this association was held in Edinburgh last week, the sessions beginning on Thursday morning in the Celtic and history class-room of the University. At the outset Mr. Smith Turner, London, vice-president, occupied the chair in the absence of Mr. C. S. Tomes, ex-president, but after the latter's address had been read, Mr. W. Bowman Macleod, Edinburgh, was installed into the chair as president. He also delivered an address, dealing chiefly with the educational aspects of dentistry. Afterwards the treasurer's report was submitted, showing that the association has a

deposit account of 800*l.* and a membership of 986. The report by the hon. secretary referred to several legal cases which had occupied the attention of the Association during the year. It was stated that the object of prosecutions was not so much in the expectation of arresting the evil of illegitimate practice, but rather with the view of establishing the meaning of the Dentists Act, and thereby gathering experience and power to grapple with the evil in a more extensive and efficient way at a not far-distant future. The report also alluded to "covering," direct dental representation on the General Medical Council, and the collective investigation of the teeth of children in national schools. Subsequently the last mentioned matter was fully reported upon by the committee who had received returns from six schools, in which a little over 700 children's teeth were examined, thus making a total of 11,422 since the commencement of the investigation. These investigations showed that teeth inevitably decay as age advanced, and that the teeth of rich children seem much more prone to decay than the teeth of poor children. Anæsthetics took up a large share of attention. On Thursday, Dr. Frederick Hewitt, London, read a communication on "An inquiry into the safety and sphere of applicability of chloroform as an anæsthetic in dental surgery," dealing with every fatality which had occurred in the British Isles during the past fifteen years (1880-1894 inclusive) in connection with the use of anæsthetics for dental operations, a special analysis being made of the chloroform fatalities. These constituted a very large proportion of the total number, and in consequence he contended that this anæsthetic should only be used under very exceptional circumstances, and that ether—an equally satisfactory agent when properly administered—should be chosen when the operation was such that nitrous oxide was inadmissible. In the course of his remarks Dr. Hewitt mentioned that during the period under review the deaths, in connection with general anæsthetics administered for dental operations in Great Britain, numbered 37. Of these, 14 occurred in Scotland, 21 in England and Wales (excluding London), and 2 in London. The discussion on this paper was taken on Friday, and the speakers did not share Dr. Hewitt's alarm, as they maintained that chloroform was rarely used by dentists and only when they were directed by doctors to use it. Other papers followed, and during both days excellent demonstrations were given in the dental hospital. That which attracted most attention was given by Mr. J. Leslie Fraser, Inverness, who was at one time connected with pharmacy. Mr. Fraser began by adjusting a Logan crown to a front tooth which was quite past reparative treatment so far as filling was concerned. He also filled the two teeth on either side of the crowned root with heavy gold foil, using the electric mallet for the purpose. The cavities in the teeth which were filled were cut out and prepared by means of a suspension engine, driven by a reversible electric motor designed by Mr. Fraser. The manner in which the machine did its work was much admired by these who were fortunate enough to secure a place from which the operation could be witnessed, but the crowd was so large that this was no easy matter. The time taken for the crowning of the tooth and the insertion of the two fillings was a little over an hour and a half, which was considered extremely rapid work, seeing that over an eighth of an ounce of gold was used for the fillings. The social arrangements of the meeting were excellent, and concluded on Saturday with a dinner in the Waterloo Hotel, at which Mr. W. B. Macleod presided, the while Mrs. Macleod held a reception for lady visitors in the Victoria Hall below.

Carbolic Acid for Cattle-abortion.

Considerable interest is being taken in the dairy circles of Scotland at present in regard to the prevention of abortion in cattle by the administration of carbolic acid. The remedy has been tried by herdsmen in Ayrshire and Dumfriesshire, and has been wonderfully successful. The dose to begin with is from 30 minims to 1 dr., well mixed with the cow's food, and it may be increased gradually, and with safety, to $\frac{1}{2}$ oz. every other day. The acid must be thoroughly well mixed with the food, and so far no observation has been made in regard to the effect of the acid upon the milk-secretion. The same treatment has been tried in Germany, but there the phenol is administered subcutaneously—viz. 5 c.c. of a 2-per-cent. solution.

French News.

(From our Paris Correspondent.)

IS HOLY WATER MINERAL-WATER?—The Catholic newspapers of the North of France announce that on the return of the pilgrim train from Lourdes a duty was levied on the holy water which a number of the pilgrims brought back with them, on the plea that it must be considered as a mineral water. Abbé Streck, Priest of Fives Saint Louis, protested against this tax at the *Lille Octroi* and declined to pay. Finally he decided to deposit 50*fr.* with a view of testing the legality of the duty in the law courts.

METRIC CONGRESS.—The quinquennial International Metric Congress was opened on Wednesday at the Paris Foreign Office by M. Hanotaux, who stated that Mexico adhered to the convention in 1891. Japan made the metric system legal in 1890; and it was applied in Tunis, to the exclusion of all others, in March last for weights and for measures of length and capacity. M. Hanotaux spoke with satisfaction of the decision of the Parliamentary Committee in England to propose the obligatory introduction of the system in England within two years.

CHRONIC POISONING BY COFFEE.—At one of the recent meetings of the Société Médicale des Hôpitaux de Paris MM. Gilles de la Tourette and Gasne referred to the injurious effects resulting from an immoderate use of coffee, especially as regards the action on the digestive organs and nervous system. In a general way they find considerable analogy between the symptoms caused by the excessive use of coffee and alcohol. Coffee dyspepsia appears to resemble alcoholic gastritis, nausea and vomiting being very pronounced. The nervous system is, however, the part most affected. Insomnia and frightful dreams are common. The patient feels giddy and is frequently attacked by cramp, especially at night.

ARGON AND HELIUM IN MINERAL-WATER.—Professor Bouchard referred, at the weekly meeting of the Academy of Sciences last Monday, to certain peculiarities of the sulpho-silicated and sulpho-sodic waters of the Pyrenees noticed by him during a recent stay in that district. For a very long time past it has been remarked that the waters taken from certain sources give off, for hours together, gaseous bubbles, which on account of their negative chemical properties have been taken for pure nitrogen. This has led to the name of "Azoales" being applied to these waters. Professor Bouchard and M. Troost, Professor of Chemistry at the Sorbonne, have made an analysis of the gases, and have found gas residues which show either the spectra of helium and argon united or that of helium alone, also a third unknown spectrum, the red part of which is characterised by a profusion of lines. Professor Bouchard does not think that any special therapeutic virtues or properties can be attributed to these peculiarities. He considers they are especially interesting from a geological point of view, and merit on that account to be thoroughly investigated.

A MELLOW CHESTNUT.—Chemist: "You might have charged that young man eighteenpence for filling that prescription. Why did you only ask sixpence?" Assistant: "He understands Latin."

COUNTER PRACTICE COMPETITION.—Up to Thursday there were seven of those to whom awards have been made in this competition who had not claimed their crowns. The list of awards is given on page 353 last week.

INTERNATIONAL FOOD AND HYGIENE "COMPETITION."—What is described as a "Grand International Competition of Alimentary Substances and Hygiene" is to be opened at Amsterdam, on September 7, in connection with the Exhibition now in progress in that city. The "competition" will remain open until October 16. Numerous entries have been received from Holland and other continental countries. As the Exhibition itself is very much of a "frost" the competition also is not likely to deserve much attention on the part of serious business houses.

American Pharmaceutical Association.

THE 43rd annual meeting of this association commenced on August 14 at Denver, Col. The Brown Palace Hotel provided the head-quarters, and there at 3.30 P.M. the Governor of the State made a speech of welcome to which Mr. William Simpson, the president of the year, responded. The most important part of the

PRESIDENTIAL ADDRESS

referred to a subject which has for some time been agitating the minds of the members of the association, viz. the education of students of pharmacy. Mr. Simpson's remarks were a striking corroboration of certain strictures which were passed upon American pharmacy in this journal two



THE PRESIDENT OF THE A. P. A.

years ago. He said, "The best interests of pharmacy as a profession demand that a definite minimum standard of preliminary general education of all persons entering drug stores to learn the art of pharmacy ought to be enforced by the boards or commissioners of pharmacy of the respective States, and that the preliminary education possessed by all such persons ought to be at least equivalent to that required for admission to the public high schools; that all persons applying for registration as pharmacists or assistant pharmacists should be required to give satisfactory evidence of sufficient general education, by examination or otherwise, and should not be registered or licensed as pharmacists or assistant pharmacists if deficient in that respect." The association resolved to that effect after discussing the matter thoroughly, but the members have not yet agreed upon the manner in which the recommendation should be enforced, and it was to this that Mr. Simpson particularly addressed himself, arguing that an examination passed before leaving school and entering the trade is what is required.

The address was well received, and was, as usual, referred to a committee. The rest of the first day was devoted to general business, which also occupied half of the second day, various reports occupying the time. These show that the Association is at present, like its British counterpart, in not too brilliant a condition. The membership has fallen to 1,533, and so many join for a year, get the certificate, and use it for business purposes, that it was resolved to do something to bring them back, or publish their names as non-payers. In the meantime, however, they are to be given a chance to pay up.

COMMERCIAL INTERESTS.

This section was presided over by Mr. George J. Seabury, who delivered an address entitled, "An Analysis of our Past and Present Professional-mercantile Obligations." Immedi-

ately after this the section took up a series of resolutions which were practically the outcome of the address, and after a good discussion and a few amendments, these were adopted in the following form:—

"Resolved, That a national committee on trade interests and local organization be created, the committee to consist of three members from this section and one from each State and Territorial pharmaceutical association and the provincial associations of Canada, said committeemen to be members of the American Pharmaceutical Association, and appointed by the presidents of the various associations aforesaid. This committee shall report annually in a condensed form the condition of trade throughout the country, and upon any other pertinent subjects, making such recommendations as are deemed necessary."

"Resolved, That a Committee on proprietary articles and pharmaceutical products be created, this committee to consist of five members. The duties of this committee shall be to report annually upon the condition of proprietary traffic, substitution and other existing evils, and to make recommendations as to the best methods of correcting them."

"Resolved, That a committee consisting of nine members be appointed as a special conference committee on resolutions, to draft any appropriate resolutions on pertinent subjects and submit them at the next session."

SUBSTITUTION.

The following queries were on the list:—

Query No. 8.—Are non-secret preparations in imitation of well-known domestic medicines a legitimate product; and is it honest for a dealer to allow his name to be printed on the label so as to give an unknown compound currency, when he is ignorant of the contents of such preparation?

Query No. 9.—Does not the pharmacist jeopardise his reputation and standing by dealing in non-secrets, when he possesses the knowledge of compounding as good or better formula?

Dr. F. E. Stewart, of Detroit, took up one side, and Mr. Josef Helfman, of the same city, the other. The discussion was lively, for half-a-dozen men, belonging to as many Detroit houses, took up the matter, and there was some nice splitting of hairs, if not cracking of heads. Mr. Hallberg, of Chicago, came down upon them like an avalanche, rebuking them for using the Association to get out their spite at each other, and so on. A Mr. Diller brought things round to a happier mood. He said: "Last night someone asked the question whether the eagle or the rabbit was the druggist, in that stuffed work of art hanging before us, and we don't yet know which is which, but that question ought to be settled. (Laughter.) An old lady came into my store and said, 'Have you got any genuine Godfrey's cordial?' I said, 'Yes, ma'am, I have.' Said she, 'Did old Godfrey make it?' and says I, 'You are asking too many questions; I know he didn't make this, because I made it myself.' (Laughter.) 'Well,' she said, 'I am going to have the genuine Godfrey's cordial.' Says I, 'The old gentleman has gone hence about 100 years, and I don't know whether he went up or down. Wherever he went, I don't know whether they have a better opinion of him than you have or not.'" (Laughter and applause.)

NEXT YEAR'S MEETING

was also settled. Mr. J. M. Good, of St. Louis, was elected President, and the third Vice-President is a woman, Mrs.

E. Miner, who, as the secretary of the Kansas Association, and an active pharmacist with original and progressive views, is well-known in the United States. We are able to give a portrait of Mrs. Miner. She is the first woman to be appointed to such an important office in a national association of pharmacists. Both Montreal and St. Paul, Minneapolis, wished the Association to make their towns the place of meeting next year, and it was agreed to meet in Montreal on August 12, 1896. We are compelled to hold the rest of our report until next week.



EDUCATIONAL INFORMATION.

PHARMACY, MEDICINE, DENTISTRY, VETERINARY SURGERY, AND SCIENCE.

PHARMACY.

IN the United Kingdom, with the exception of the adjacent islands in the Channel and the Isle of Man, pharmacy is, in a limited sense, controlled by Acts of Parliament, those for Great Britain and for Ireland being distinct, and separately administered. Both countries, however, are alike in respect to requiring certain standards of elementary and technical or scientific education, the enforcement of which is entrusted to the Pharmaceutical Societies of Great Britain and Ireland. It is unnecessary to particularise here the executive functions relating to education and examination, for our purpose is simply to instruct those entering pharmacy, or who are in it and wish to qualify, how they should proceed. As to

GREAT BRITAIN,

there are two titles recognised—viz., “chemist and druggist,” or its equivalents, dispensing chemist, &c., and ‘pharmaceutical chemist,” with its equivalents, pharmacist and pharmacist. The former title is a very old one, and was in common use up to 1841, when the Pharmaceutical Society began to grant pharmaceutical-chemist diplomas to its members. By the Pharmacy Act of 1852 this title, pharmaceutical chemist, is reserved for those who have passed the Preliminary, Minor, and Major examinations of the Society. The title “chemist and druggist” remained free until 1863, when the Sale of Poisons Act of that year made it law that only those who are registered as chemists and druggists may sell, compound, or dispense certain poisons, the rights of medical practitioners and veterinary surgeons (in a limited sense) being reserved. Those in business on their own account at that time were registered without examination, assistants were registered on passing a modified examination (still in force, but open only to those who sent in their names before 1870), and all who have entered the trade since have had to pass the Preliminary (“First”) and Minor examinations. No fixed period is set for passing the “First” examination; but, as it is in purely scholastic subjects, it should be passed before apprenticeship is commenced. Better, while the youth is at school, he should consult with his teacher as to the desirability of passing an examination now recognised by the Pharmaceutical Society as equivalent to its own Preliminary examination. Many boys and girls in England and Wales now pass the College of Preceptors’ examination, or Cambridge or Oxford Locals, and in Scotland the leaving certificate of the Education Board is commonly taken before leaving school. It is important to know that all these are included in the Society’s list, and once having secured one or other of such certificates, covering, of course, Latin, English, and arithmetic, the apprenticeship may be proceeded with, and the certificate presented any time not later than three months before the second stage of qualification—viz., the Minor examination. The following is the official statement regarding the

SUBJECTS OF THE EXAMINATION.

Latin.—Grammar; translation of simple sentences from English into Latin; translation into English from Caesar, “De Bello Gallico,” Book I., or Virgil, “Æneid,” Book I. In each examination-paper passages from both of these authors will be given, but a candidate is required to translate from one author only.

Arithmetic.—Numeration; the first four rules—simple and compound; reduction; vulgar and decimal fractions; simple and compound proportion; a thorough knowledge of the British and metrical systems of weights and measures; percentages and stocks. In each examination-paper a question

will be given involving a knowledge of the metrical system, which every candidate will be required to attempt.

English.—Grammar and composition. In awarding marks, spelling and the quality of the handwriting are taken into account.

The fee for the examination is two guineas, which must be paid to Mr. Richard Bremridge, 16 Bloomsbury Square, London, W.C., not later than fourteen days before the first day of the month in which the examination is held. It is held in January, April, July, and October each year, at the following centres:—

Aberdeen	Douglas, Isle of	Kirkwall, Ork-	Nottingham
Aberystwith	Man (in July	ney (in July	Oxford
Birmingham	only)	only)	Penzance
Brighton	Dundee	Launceston	Peterborough
Bristol	Edinburgh	Leeds	Plymouth
Cambridge	Exeter	Lincoln	Sheffield
Canterbury	Glasgow	Liverpool	Shrewsbury
Cardiff	Guernsey (in	London	Southampton
Carlisle	July only)	Manchester	Worcester
Carmarthen	Hull	Newcastle-on-	York
Carnarvon	Inverness	Tyne	
Cheltenham	Jersey (in July	Northampton	
Darlington	only)	Norwich	

The local secretaries superintend the examination, but do not adjudicate upon the answers given in, as that duty is reserved for the College of Preceptors, who set the questions and report to the Society’s Boards of Examiners. The examination is generally held in a hall, hotel, or other public building, and commences promptly at 11 o’clock, when the Latin paper is given out. The answers are collected at 12.30, and the arithmetic paper then distributed. One-and-a-half hour is allowed for that, then an hour for luncheon, and the candidate returns at 3 o’clock to write the paper in English. In the course of a fortnight the results are published, and in the event of anyone failing to pass, he is admitted, after three months and within a year, on payment of an additional fee of one guinea.

The nature of this examination is very fully described in a book which we publish at 2s. It is written by Mr William Dodds, an experienced tutor, and it gives many hints in regard to preparation for the examination, as well as the questions which have been set for it during past years. Therein will be found mentioned the most suitable text-books in the various subjects. It is a book as useful to those preparing to enter the trade as for those who are in and are unfortunate enough not to have passed the examination.

The following is a list of the

CERTIFICATES ACCEPTED

by the Pharmaceutical Society in lieu of their own examination:—

Oxford University.—Junior or senior local examinations; responsions; moderations; examination for a degree in arts.

Cambridge University.—Junior or senior and higher local examinations; previous examination; examination for a degree in arts.

Durham University.—Junior or senior local examinations; registration examination for medical students; examination for students at the end of their first year; examination for a degree in arts or science.

London University.—Matriculation and preliminary scientific (M.B.) examinations; examination for a degree in arts or science.

Victoria University.—Entrance examination in arts of the faculty of medicine; preliminary examination.

Edinburgh University.—Junior or senior local examinations; preliminary examination for graduation in science or medicine; examination for a degree in arts or science.

Aberdeen, Glasgow, and St. Andrews Universities.—Same as Edinburgh.

Dublin University.—Public entrance examinations; examination for a degree in arts.

Royal University of Ireland.—Matriculation; first or second university examinations; examination for a degree in arts.

Queen's University in Ireland.—Local examinations; entrance or matriculation examination; previous examination for B.A. degrees; examination for a degree in arts.

Oxford and Cambridge Schools' Examination Board.—Certificate.

Royal College of Surgeons in England.—Preliminary examination.

Apothecaries' Society of London.—Examination in arts.

Royal Colleges of Physicians and Surgeons of Edinburgh.—Preliminary examination. [Note by Editor.—See last par. p. 388.]

Faculty of Physicians and Surgeons of Glasgow.—Preliminary examination. [Note by Editor.—See last par. p. 388.]

Royal College of Surgeons in Ireland.—Preliminary examination.

Apothecaries' Hall of Ireland.—Preliminary examination.

Intermediate Education Board for Ireland.—Certificates.

Queens College.—Junior students' general examination.

College of Preceptors.—First or second class certificate.

Incorporated Law Society.—Preliminary examination.

Scotch Education Department.—The honours and first-grade leaving certificates are accepted, provided the certificates in English, Latin, and arithmetic are all obtained at any one annual examination.

It should be understood that anyone submitting one of these certificates must pay the fee of two guineas, and it must be approved by the Board of Examiners before the holder can enter for the Minor examination.

Other certificates—for example, those of foreign and colonial universities—which show that the holder has passed an examination in English, Latin, and arithmetic, may also be accepted by the Society, but only on special resolution of the Council, in regard to which communications should be made to the secretary. Once a certificate is accepted, or the examination passed, the person is registered as an apprentice, or student of pharmacy.

The old period of apprenticeship—five years—is practically dead. Four, even three, years are regarded by many as long enough to initiate

one into the art and mystery of pharmacy, the shorter period having been brought about through the Pharmaceutical Society putting down three years' practical experience in compounding medical prescriptions as necessary for the Minor examination. Although that is the case, apprentices are not accepted in the best pharmacies for a shorter period than four years. In England and Wales indentures are frequently signed, and those apprentices who live with their employers pay premiums varying from 50*l.* to 100*l.*, but in a few cases an even higher premium is paid. Outdoor apprentices do not, as a rule, pay a premium, or, if they do, it is returned as wages. In Scotland premiums are not paid, and indentures are rarely signed, while apprentices receive wages beginning at from 3*s.* to 5*s.* per week the first year to 10*s.* or 12*s.* per week in the fourth year.

Systematic apprenticeship is somewhat rare, and for that reason it is desirable that care should be exercised in selecting a place and a man with whom the apprentice is to learn the business. In every place, however, the first year or two have much drudgery in them; but experience shows that this is not bad if not overdone, as acquaintance with bottle-washing and the care of dispensing-counter utensils, &c., is the first step to the care and cleanliness requisite in elegant pharmacy. The apprentice may during his pupilage lay the foundation of his knowledge of the sciences, for where evening classes are available the instruction given is extremely valuable, and has a widening influence which examiners readily recognise as evidence that a man is not crammed. Hence the importance of passing the Preliminary examination before pupilage is entered on. Apart from chemistry, physics, and botany (in which subjects there are evening classes in most towns), the apprentice should keep his knowledge of Latin fresh by reading Pereira's "Selecta à Prescriptis" or Ince's "Latin Grammar," adding some practice in writing and translating Latin prescriptions. He should also read the B.P., Squire's "Companion," or Cripps's "Pharmacy," using the "Art of Dispensing" as a guide for difficulties at the dispensing-counter. Some knowledge of therapeutics is desirable, and there are few apprentices who do not find a quiet hour at Ringer's book or Lauder Brunton's enjoyable, but the smaller works, such as Mitchell Bruce's, are also useful—indeed, the apprentice cannot go far wrong with any modern therapeutic work: the main thing is to get to know what medicines are used for. Reading of

this kind is more to fit the apprentice for the duties of his calling than for the

MINOR EXAMINATION,

the schedules of which should always be regarded as a mere general outline of the requirements, or as a guide to the student in the final period of work before entering the examination-room. Some say that attending South Kensington science classes is useless, because the instruction is not on Minor examination lines. This is a mistake made by many pharmaceutical students. Pharmaceutical teachers and examiners are agreed that preliminary instruction in the science subjects of the Minor examination is of the highest importance, for after such instruction the student is better able to understand the teaching in the Schools of Pharmacy. We now append the subjects of the Minor examination, as fully detailed by the Council of the Pharmaceutical Society, which "recommends that all Candidates before presenting themselves for examination should receive a systematic course of instruction occupying a period of not less than six months; and that such period of study should include at least sixty lectures in chemistry, eighteen hours' work in each week in practical chemistry, forty-five lectures and demonstrations in botany, and twenty-five lectures and demonstrations in materia medica."

CHEMISTRY AND PHYSICS.

The candidate will be expected to possess an elementary knowledge of

(a) The law of the conservation of energy; the law of gravitation; the balance; specific gravity; atmospheric pressure; the barometer, air-pump, and syphon; the law of Boyle; temperature; thermometer; the law of Charles; the law of gaseous diffusion; V. Meyer's method for determining vapour densities.

(b) The chief characteristics of chemical action, the distinction of elements and compounds; the laws of chemical combination by weight and volume; the hypothesis of Avogadro; atomic weight and molecular weight; chemical formulæ and nomenclature; valency; the distinction between metals and non-metals.

(c) The general characters of the non-metals; the chief methods of preparation and the typical reactions of the following non-metallic elements and compounds:—Hydrogen, oxygen, ozone, water, peroxide of hydrogen; chlorine, bromine and iodine, and their compounds with hydrogen and oxygen; fluorine, hydrofluoric acid; nitrogen, ammonia, the oxides of nitrogen, nitrous acid, nitric acid; sulphur, sulphuretted hydrogen, sulphurous and sulphuric anhydrides and acids, thiosulphuric acid; phosphorus, phosphine, the oxides and oxy-acids of phosphorus, the chlorides of phosphorus; silicon, silica, fluoride of silicon, silicofluoric acid; boron, boric acid. The usual impurities in those of the above-named substances that are included in the British Pharmacopœia.

(d) The general characters and classification of the metals, and the general methods of forming oxides and salts; the sources, the usual methods of extracting, and the chief properties of, the undermentioned metals, and the principal modes of preparation, properties, adulterations, and contaminations of such of their compounds as are described in the British Pharmacopœia:—Potassium, sodium, ammonium, lithium, barium, calcium, magnesium, zinc, aluminium, iron, chromium, manganese, arsenium, antimony, tin, copper, bismuth, lead, silver, mercury, gold, and platinum.

(e) Carbon, its oxides, cyanogen, hydrocyanic acid, cyanide of potassium, ferrocyanide and ferricyanide of potassium, oxalic acid. The chief methods of preparing marsh gas, ethylene, alcohol, aldehyde, acetic acid, acetate of ethyl, spirit of nitrous ether, nitrite of amyl, hydrate of chloral, chloroform, iodoform, ether; the principal properties, reactions, and mutual relations of these compounds. The candidate will also be expected to possess a general knowledge of the methods of estimating carbon, hydrogen, oxygen, and nitrogen in organic compounds, and of obtaining molecular formulæ.

Note.—Candidates will be expected to solve simple problems relating to the weight and volume, under different conditions of temperature and pressure, of elements and compounds concerned in chemical reactions.

Practical Examination.

To determine the specific gravity of liquids and solids, to be familiar with the general construction and use of the thermometer and barometer.

To recognise by chemical tests the more important non-metallic elements and compounds, as well as the metals and salts indicated in the foregoing list; to detect the chief impurities in those that are included in the British Pharmacopœia; to recognise by their physical properties those which possess well-defined characteristics.

To identify by chemical tests the organic compounds before enumerated, and, in addition, tartaric and citric acids, starch, cane-sugar, grape-sugar, salicin, quinine, morphine, and strychnine; and to detect the impurities in such as are included in the British Pharmacopœia.

To perform those volumetric determinations which are described in the British Pharmacopœia.

To be familiar with the construction and use of the balance, and to have a practical knowledge of the British and metric systems of weights and measures.

To quantitatively determine the total alkaloids in cinchona-bark, and in the tincture and extract of *nux vomica*, and the morphine in opium.

The candidate will further be expected to have a practical acquaintance with the methods of preparing the more important inorganic substances, including the non-metals and their compounds, and such metallic compounds as are included in the British Pharmacopœia, and also the following organic compounds:—Ether, chloroform, spirit of nitrous ether, nitrite of amyl, acetate of ethyl, and hydrocyanic acid, so that he may be able to explain to the examiner the operations involved in their preparation, and, if called upon, to perform the operations or certain stages of them himself.

BOTANY.

The candidate will be required to recognise any of the plants specified in the list appended to this schedule; to refer any flowers that may be shown to him to their class and sub-class; to possess a general knowledge of the internal structure of stems, leaves, and roots, and their parts, and of the elementary tissues of which they are composed; to describe a cell, its structure, and usual contents; to explain the thickening of cell-walls, and to describe the manner in which cells are combined to form tissues. To distinguish between roots and stems, and to name such important modifications of either as present distinguishing characteristics. To name correctly such leaf-shapes as are shown, and to recognise appendages or any important modifications of the leaf. To have a practical knowledge of the various arrangements of leaves or flowers in the bud, and of the different kinds of phyllotaxis and of inflorescence; to understand the principles of branching, and the different kinds of branch systems. To possess a general knowledge of the processes of reproduction of plants, and to describe those of phanerogams and ferns. To name and describe the arrangements of the parts of the flower, the number, position, and shape of the floral envelopes, and of the organs of reproduction; to name and describe the different kinds of fruits, and the various modes of dehiscence and kinds of placentation. To have a general knowledge of the physiology of plants, and to describe the functions of the roots, stems, and leaves. To be acquainted with the materials which form the food of plants, and to understand the part played by starch, sugar, and aleurone grains in the life of the plant. To recognise, by means of the microscope, sections of stems of dicotyledonous, monocotyledonous, and cryptogamic plants; spiral, reticulated, and scalariform vessels; as well as the simpler structures, such as stomata, pollen grains, and hairs.

List of Plants for Recognition.

Aconitum Napellus, *Papaver Rhœas*, *P. somniferum*, *Brassica alba*, *Cochlearia Armoracia*, *Althœa officinalis*, *Ruta graveolens*, *Cytisus Scoparius*, *Rosa canina*, *Bryonia dioica*, *Æthusa Cynapium*, *Conium maculatum*, *Foeniculum capillaceum*, *Gentiana crocata*, *Valeriana officinalis*, *Achillea Millefolium*, *Anthemis nobilis*, *Matricaria Chamomilla*, *Taraxacum officinale*, *Menyanthes trifoliata*, *Borago officinalis*, *Atropa Belladonna*, *Datura Stramonium*, *Hyoscyamus niger*, *Solanum Dulcamara*, *Digitalis purpurea*, *Lavandula vera*, *Mentha piperrita*, *M. viridis*, *M. Pulegium*, *Rosmarinus officinalis*, *Daphne Laureola*, *D. Mezereum*, *Juniperus Sabina*, *Taxus baccata*, *Colchicum autumnale*, *Arum maculatum*, *Avena sativa*, *Hordeum vulgare*, *Triticum sativum*, *Aspidium Filix-mas*.

MATERIA MEDICA.

The candidate is required to recognise specimens of any crude drug mentioned in the British Pharmacopœia or in the annexed list, and to describe their methods of production and their characteristics so far as may be necessary to detect adulteration or substitution. He must be familiar with their geographical sources, the botanical and zoological names of the plants and animals yielding them, the natural orders to which they belong, and the localities from which they are obtained. The candidate will be required to name their chief active constituents and also the official preparations into which they enter.

Roots.—*Althœa officinalis*, *Inula Helenium*, *Alkanna tinctoria*, *Bryonia alba et dioica*.

Rhizomes, &c.—*Helleborus niger*, *Sanguinaria canadensis*, *Iris florentina*, *Allium sativum*, *Veratrum album*, *Acorus Calamus*, *Agropyron* (*Triticum*) *repens*.

Barks.—*Berberis vulgaris*, *Cinnamodendron corticosum*, *Simaruba amara*, *Erythrophæum guineense*, *Quillaja Saponaria*, *Prunus serotina*, *Ulmus campestris*, *U. fulva*, *Cinnamomum Cassia*, *Coto*.

Herbs.—*Grindelia squarrosa et robusta*, *Tussilago Farfara*, *Spigelia marilandica*, *Marrubium vulgare*, *Solanum Dulcamara*, *Euphorbia pilulifera*, *Convallaria majalis*.

Flowers.—*Calendula officinalis*, *Pyrethrum cinerariæfolium*, &c., *Arnica montana*.

Fruits.—*Punica Granatum*, *Cuminum Cuminum*, *Capsicum annuum*, *Laurus nobilis*, *Piper longum*, *Vanilla planifolia*.

Seeds.—*Paullinia sorbilis* (*Guarana*), *Trigonella Fœnum-græcum*, *Dip-*

teryx odorata, *Pyrus Cydonia*, *Strychnos amara*, *Hyoscyamus niger*, *Amomum Melegueta*, *Areca Catechu*.

Hairs.—*Mucuna pruriens*.

Juices, &c.—*Acacia Catechu*, *Lactuca virosa* (*Lactucarium*), *Aloe spicata* &c., *Curare* (*Woorari*).

Gum-Resins.—*Boswellia Carterii*, &c., *Euphorbia resinifera*.

Oleoresins.—*Pistacia Terebinthus*.

Resins.—*Callitris quadrivalvis*, *Pinites succinifer*, *Calamus Draco*.

Cryptogamic Substances.—*Lycopodium clavatum*, &c., *Fucus vesiculosus*, *Chondrus crispus*.

Animal Substances.—*Spongia officinalis*, *Coccus Lacca*, *Mylabris Cichorii*, *Sepia officinalis*, *Castor Fiber*.

PRESCRIPTIONS.

The candidate is required to read without abbreviation autograph prescriptions; translate them into English; understand the grammatical construction of the Latin; and render a literal as well as an appropriate translation of the directions for use. To detect errors, discover unusual doses, and have a general knowledge of posology. To calculate percentages and other quantities occurring in prescriptions; also to render in good Latin ordinary prescriptions written in English.

PRACTICAL DISPENSING.

To weigh, measure, and compound medicines; write the directions in concise language in a neat and distinct hand; to finish and properly direct each package. [*In awarding marks in this subject the time taken by the candidate in doing the work is taken into account.*]

PHARMACY.

The candidate will be required to possess a general knowledge of the following branches:—

(a) Operations requiring the use of heat. Evaporation, with particular reference to the preparation of extracts and inspissated juices; special characters and modes of preparing the various classes of extracts; influence of surface, temperature, and pressure upon the rate of evaporation; water, steam, and sand baths; distillation, ordinary, fractional, and destructive, distinctive characters and objects of each; official preparations illustrating the various kinds of distillation, apparatus employed, the retort and receiver, still and worm, Liebig's condenser, principles on which they are constructed and used. Sublimation; its objects and applications in pharmacy; official products of sublimation, calcination, and fusion. Desiccation; temperature best suited for drying particular drugs, loss in drying vegetable drugs, forms of drying-ovens, principles on which they are constructed and used.

(b) Disintegration of solid substances; cutting, bruising, and pulverisation; apparatus employed, principles indicating which is to be adopted in particular instances; methods for controlling the degree of comminution sieves and sifting, trituration, levigation, elutriation, granulation, including methods for producing certain chemicals as fine powders, small crystals, scales, &c. Solution: its nature, solvent power of various menstrua, influences of (a) temperature; (b) state of division of the substance to be dissolved; (c) time; (d) position of the substance in the menstruum; lixiviation, infusion, digestion, and decoction; maceration, percolation, and displacement, principles on which the successful performance of these processes depends; form and materials for percolators and other vessels employed. Filtration, objects and methods, filtering media, means of expediting filtration; dialysis: its application in pharmacy, construction and use of the dialyser. Expression: methods of obtaining the juices from plants; recovery of the residual liquids from tincture-marks, &c.; screw, hydraulic, and other presses. The principles involved in the dispensing of medicines, particularly with reference to the best excipients and methods for forming pill-masses, the preparation and nature of emulsions, the most suitable emulsifying agents, and the best means of suspending insoluble substances in liquids.

(c) The candidate will also be required to show a practical knowledge of the processes, and understand the principles of the processes, by which the official preparations belonging to the following classes are made, viz.:—Colloids, confections, decoctions, dilute acids, extracts (solid and liquid), glycerines, infusions, juices, liniments, lotions, mixtures, ointments, pill-masses, plasters, powders (simple and compound), solutions, spirits, suppositories, syrups, tinctures, vinegars, waters, and wines. He must be able to conduct such of the operations, or parts of them, as may be required by the examiner. A knowledge of the proportion of active ingredient or crude material in official preparations containing aconite, antimony, arsenic, belladonna, Calabar bean, cantharides, hydrate of chloral, chloroform, caustic potash and soda, colchicum, digitalis, elaterium, ergot, iodine, iodoform, ipecacuanha, lead, mercury, *nux vomica*, opium, phosphorus, scammony, stramonium, squill, alkaloids and alkaloidal salts.

POISONS.

Candidates will be required to enumerate the poisons contained in Schedule A of the Pharmacy Act, 1868, and those since added thereto, in pursuance of the provision contained in section 2 of that Act, viz.:—

- Poisons within Part I. of the schedule.
- Poisons within Part II. of the schedule.

They will be required to describe minutely the conditions required upon the sale by retail of poisons, both in Part I. and Part II. of Schedule A; and to write the proper entry required, according to Schedule F of the Act, for the sale of a poison coming within Part I. of Schedule A. They will also be required to state the conditions imposed on the sale of scheduled poisons by wholesale and for export; and upon the sale of a scheduled poison when forming an ingredient in a medicine dispensed.

A knowledge of the conditions imposed on the sale of arsenic by the Arsenic Act will also be required.

Note.—Candidates must not take into the examination-rooms or laboratories any books or any notes or memoranda, whether written or in print.

How to Enter.

No one is admitted to the examination who has not passed the First examination, completed his or her 21st year, and been registered and employed as an apprentice or student, or has otherwise for three years been practically engaged in the translation and dispensing of prescriptions. Certificates covering these requirements have to be sent to Mr. Richard Brembridge, 16 Bloomsbury Square, London, W.C., along with the fee of 5*l.* 5*s.*, on or before the 15th day of the month previous to which the Boards of Examiners meet. This is in

When and Where Held.

January, April, July, and October each year; but, as a matter of fact, the examination may begin in the latter days of the months previous. There are two Boards—one for England and Wales, meeting in London, and composed of Professors Percy Frankland and Herbert Macleod (chemistry), Professor J. R. Green and Mr. A. C. Seward (botany), and eight pharmacists who examine in any subject; the second Board is for Scotland, and meets in Edinburgh: Professor Patrick Geddes (botany), Professor John Gibson (chemistry), and six pharmacists constitute the Board. The candidate may, irrespective of the locality in which he resides, be examined in Edinburgh or London, but he must tell Mr. Brembridge which he desires when sending the fee. The examination is practical and oral. The former is held first, three hours being devoted to practical chemistry, and three hours to practical dispensing and pharmacy—*i.e.*, one subject in the forenoon and one in the afternoon, the batches of candidates changing places. Should the candidate survive this ordeal, he is informed when he has to appear for the oral examination in all the subjects except dispensing. As a rule, an interval of from three to eight days intervenes. There is a good description of the examination in *THE CHEMIST AND DRUGGIST*, July 27 last, and a shorter account by an unsuccessful candidate appears in the present issue. Should the candidate fail to pass, he may, on payment of 3*l.* 3*s.*, enter for any of the three examinations immediately following that for which the full fee was paid.

THE MAJOR EXAMINATION.

This examination is a voluntary one, and those who pass it get the qualification of pharmaceutical chemist. Of every seven who pass the Minor examination about one afterwards passes the Major, and the proportion of the two grades on the registers is the same—*viz.*, six to one. It does not follow that all the best men in the trade go through the Major, or that all those who pass are to be ranked amongst the best men; but, unquestionably, those with aspirations for pride of place, and the like, are not complete without the Major diploma. Moreover, the Pharmaceutical Council has made it easy for them by reducing the fee to 3*l.* 3*s.* The examination itself is stiff; but three or four months' extra study in a school generally suffices to get a good student through.

The following are the subjects:—

CHEMISTRY AND PHYSICS.

In addition to the subjects indicated by the schedule for the Minor examination, the candidate will be expected to possess a knowledge of the most important facts connected with—

1. The physical constitution of the three states of matter; liquefaction of gases, critical point; the diffusion of gases and liquids, dialysis; methods for determining vapour densities; solution.
2. The dynamical theory of heat; heat and temperature; sources, development, and propagation of heat; radiation, diathermancy and athermancy, separation of heat from light; latent heat; boiling-point, distillation; freezing mixtures; specific heat; calorimeters; relation of specific heat to atomic weight; thermometers, the air-thermometer; methods of determining exceedingly high and low temperatures.
3. The undulatory theory of light; reflection; refraction; propagation of light, the photometer; mirrors and lenses, the microscope; decomposi-

tion of white light by a prism; the spectroscope, spectrum analysis double refraction; polarisation, the polariscope; influence of light in promoting chemical change, the principles of the ordinary photographic processes.

4. The methods of producing magnetism; magnetic induction. Sources of electricity, frictional electricity; the electroscopes; electric induction; electric machines; the Leyden jar; voltaic electricity; the principal forms of voltaic batteries; the galvanometer; chemical effects of current; electrolysis; measurement of current, Ohm's law; voltmeter; secondary currents, secondary batteries; thermo-electricity, the thermopile; production of heat and light from electricity; electromotors; dynamo-machines.

5. The history of the atomic theory; the hypothesis of Avogadro; the methods by which the standard atomic weights have been determined; dissociation; specific volume; the periodic law.

6. Classification of carbon compounds; rational formulæ; isomerism. The characteristics and constitution of the chief typical organic compounds. The constitution, sources, methods of preparation, properties, reactions, and mutual relations of the following organic compounds: *Cyanogen derivatives.*—Urea, cyanuric acid, uric acid. *Hydrocarbons.*—The principal members of the paraffin, olefine, acetylene, and benzene series; their chief haloid and nitro-derivatives. Theory of isomerism in paraffin and benzene series. *Paraffin derivatives.*—Distinction of primary, secondary, and tertiary alcohols; the chief primary monohydric alcohols; glycol; glycerine (glycerol); mannite; acetaldehyde, chloral; chloral hydrate; acetone; ether; the principal acids of the acetic series; oleic acid; glycolic and lactic acids; oxalic, succinic, malic, tartaric, racemic, and citric acids; ethylamine; acetamide; glycocine; cane sugar; grape sugar; milk sugar; maltose; starch and cellulose. *Benzene derivatives.*—Phenol sulphonic acid; phenol; resorcin (resorcinol); aniline; benzaldehyde; salicylaldehyde; benzoic acid; salicylic acid. The principal properties of the terpenes and camphors, essential oils, resins. The characteristics of naphthalene and its derivatives. The processes of alcoholic, acetic, lactic, and ammoniac fermentation. The properties and decomposition products of the principal glucosides, alkaloids, and other substances of definite chemical composition in the British Pharmacopœia.

Practical Examination.

The candidate will be expected to be able—To analyse mixtures containing three metallic salts; to estimate the nitrogen in organic compounds by the soda-lime process; to determine melting and boiling points. To perform the operations (or certain stages of them) necessary for the preparation of cyanogen, artificial urea, ethyl chloride, iodoform, ethylene, ethylene dibromide, acetaldehyde, formic acid, oxalic acid, nitrobenzene, aniline, benzoic acid, the nitrophenols. To recognise by their chemical reactions, and to determine, where necessary, by the pharmacopœial gravimetric or volumetric methods, the strength and purity of the most important of the inorganic and organic compounds (including crude drugs and galenical preparations) described in the British Pharmacopœia. To detect and separate the most important alkaloids, alkaloidal salts and glucosides, and to separate in the pure state morphine from opium and strychnine from *ux vomica*. *Standard works of reference are provided for the use of candidates, at the discretion of the examiner. No other books or memoranda are allowed.*

BOTANY.

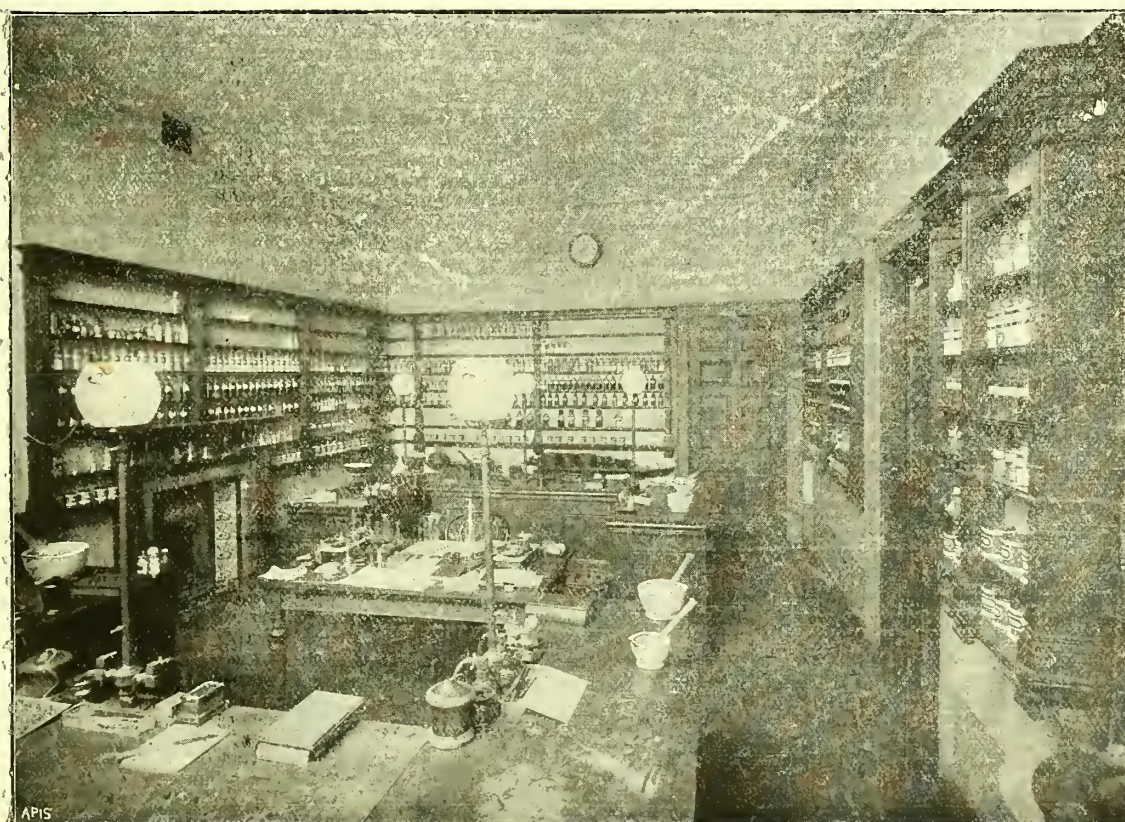
In addition to what is required for the Minor, the candidate is expected to possess an intimate acquaintance with the parts of the flower, fruit, and seed; to describe the structure and development of the pollen and of the ovule, and to trace the steps by which the latter is transformed into the seed. To have an intimate knowledge of the structure of cells, whether isolated or in combination, to form tissues; of the contents of cells in their various stages of development; and a general knowledge of the origin of gums, acids, and mineral and other secretions of plants. To be familiar with the composition of the cell-wall, its chemical nature, properties, and reactions; with the changes it undergoes in the formation of wood, cork, and mucilage, and in the processes of thickening and cuticularisation. To possess a knowledge of the general principles of classification, the system of Linnæus, and of the natural system founded upon that of De Candolle. To be able to distinguish practically the natural orders included in the schedule appended below, and such of the leading genera of each of these orders as are therein specified; also to refer to their respective orders or genera such specimens included in the schedule as may be shown to him. To possess a general knowledge of the method of reproduction in cryptogams, and to describe that of mosses; to be familiar with the development of the spores in these plants, and to be able to compare the different organs with the corresponding organs in phanerogams; to possess a knowledge of the alternation of generations in the cryptogams, and the modifications under which this is represented in the phanerogams. To have a practical acquaintance with the use of the microscope, and by means of it to recognise the various tissues found in the plant, the reproductive organs of cryptogams and phanerogams, and the more important cell-contents.

Schedule.

RANUNCULACEÆ.—Anemone, Helleborus, Aconitum.—PAPAVERACEÆ.—Papaver, Chelidonium.—CRUCIFERÆ.—Brassica, Cochlearia.—



PHARMACEUTICAL SOCIETY'S EXAMINATION HALL, LONDON.



PHARMACEUTICAL SOCIETY'S EXAMINATION DISPENSARY, LONDON.

VIOLACEÆ.—Viola. — MALVACEÆ.—Malva. — RUTACEÆ.—Ruta. —
 LEGUMINOSÆ.—Lathyrus, Mimosa, Cereis. — ROSACEÆ.—Prunus, Spiræa,
 Potentilla, Rosa, Pyrus. — CUCURBITACEÆ.—Echaliun, Bryonia. — UM-
 BELLIFERÆ.—Eryngium, Cicuta, Carum, Cenanthe, Feniculum, Daucus,
 Conium, Coriandrum. — DIPSACEÆ.—COMPOSITEÆ.—Tussilago, Inula,
 Matricaria, Anthemis, Cichorium, Lactuca. — CONVULVULACEÆ.—
 GENTIANACEÆ.—Erythraea, Menyanthes. — SOLANACEÆ.—Solanum,
 Physalis, Atropa, Hyoscyamus, Datura. — SCROPHULARIACEÆ.—Verbascum,
 Scrophularia, Digitalis. — LABIATÆ.—Mentha, Origanum, Thymus,
 Lamium, Marrubium. — POLYGONACEÆ.—Polygonum, Rumex. —
 EUPHORBACEÆ.—Euphorbia, Buxus. — CUPULIFERÆ.—Fagus, Quercus,
 Corylus. — SALICACEÆ.—Salix. — BETULACEÆ.—Alnus. — CONIFERÆ.—
 Juniperus, Pinus. — ORCHIDACEÆ.—AMARYLLIDACEÆ.—IRIDACEÆ.—
 Iris, Crocus. — LILIACEÆ.—Convallaria, Ruscus, Allium. — GRAMINEÆ.

MATERIA MEDICA.

This comprises a practical knowledge of the methods of estimating the value of important drugs, of distinguishing commercial varieties of the same, and of separating such of their active principles as are official in the British Pharmacopœia. The candidate is also expected to have a general acquaintance with the active constituents of all important drugs, and to possess a general knowledge of the chemical properties of the official alkaloids, glucosides, resins, and essential and fixed oils. The microscope will be introduced for the examination of certain drugs.

How Conducted. The principle of conducting the Major examination differs from that of the Minor, for the higher examination commences with a written portion, and the oral examination, if any, is only taken in doubtful cases, and after the practical work. Two days are occupied with the written examination, each of four sittings of three hours being devoted to a specific subject. First, there is a paper on chemistry, generally six questions, the nature of which is fairly exemplified in the following:—

1. Write an account of the periodic law.
2. Discuss the analogy of nitrogen, phosphorus, and arsenic.
3. Describe Raoult's method of determining molecular weights. What special value does this method possess?
4. Show by equations what occurs when aldehyde is treated with—(a) reducing agents; (b) oxidising agents; (c) ammonia; (d) hydrocyanic acid; (e) sodium hydrogen sulphite.
5. State what you know about the isomeric forms of tartaric acid.
6. What are mercaptans? How are they produced, and what do they yield by oxidation?

Physics is taken separately, and is also dealt with in five or six questions such as:—

1. What is meant by the "critical point" of a gas? Describe some methods of liquefying gases.
2. Draw diagrams to illustrate the structure of the spectroscope. What are ultra-violet and ultra-red rays, and how may their presence be recognised?
3. How would you determine the specific heat of lead?
4. Describe the construction of the balance, and show clearly how (a) accuracy and (b) delicacy are obtained.
5. What is Ohm's law? What is the strength of the current passing through a wire having a resistance of 4.5 ohms, connected with a battery of six cells arranged in series, the E.M.F. of each cell being 1.8 volts, and its internal resistance .7 ohm?
6. An electric current is passed successively through acidulated water, solution of cupric sulphate, and argentic nitrate. When 15 c.c. of mixed gases have been evolved from the water, what weights of copper and silver will have been deposited?

Cu = 63.4; Ag = 108.

The peculiarity of the botany examination is that a little practical microscopic work is always thrown into it; this is generally in the nature of recognition. We give a sample:—

1. Report upon the section submitted to you for microscopical examination. N.B.—Not more than fifteen minutes can be allowed to each candidate for the use of the microscope.
2. Distinguish between the natural orders Rosaceæ and Ranunculaceæ. Name the more important indigenous genera of the Rosaceæ.
3. Describe the occurrence of latex in plants. Name any natural orders in which it is found. Mention any medicinal or economic products derived from it.
4. Describe the method of reproduction in mosses.
5. What do you understand by a spurious fruit? Give examples and describe their formation.
6. State what you know respecting the occurrence of silica in plants.

Materia medica generally follows botany, sometimes on

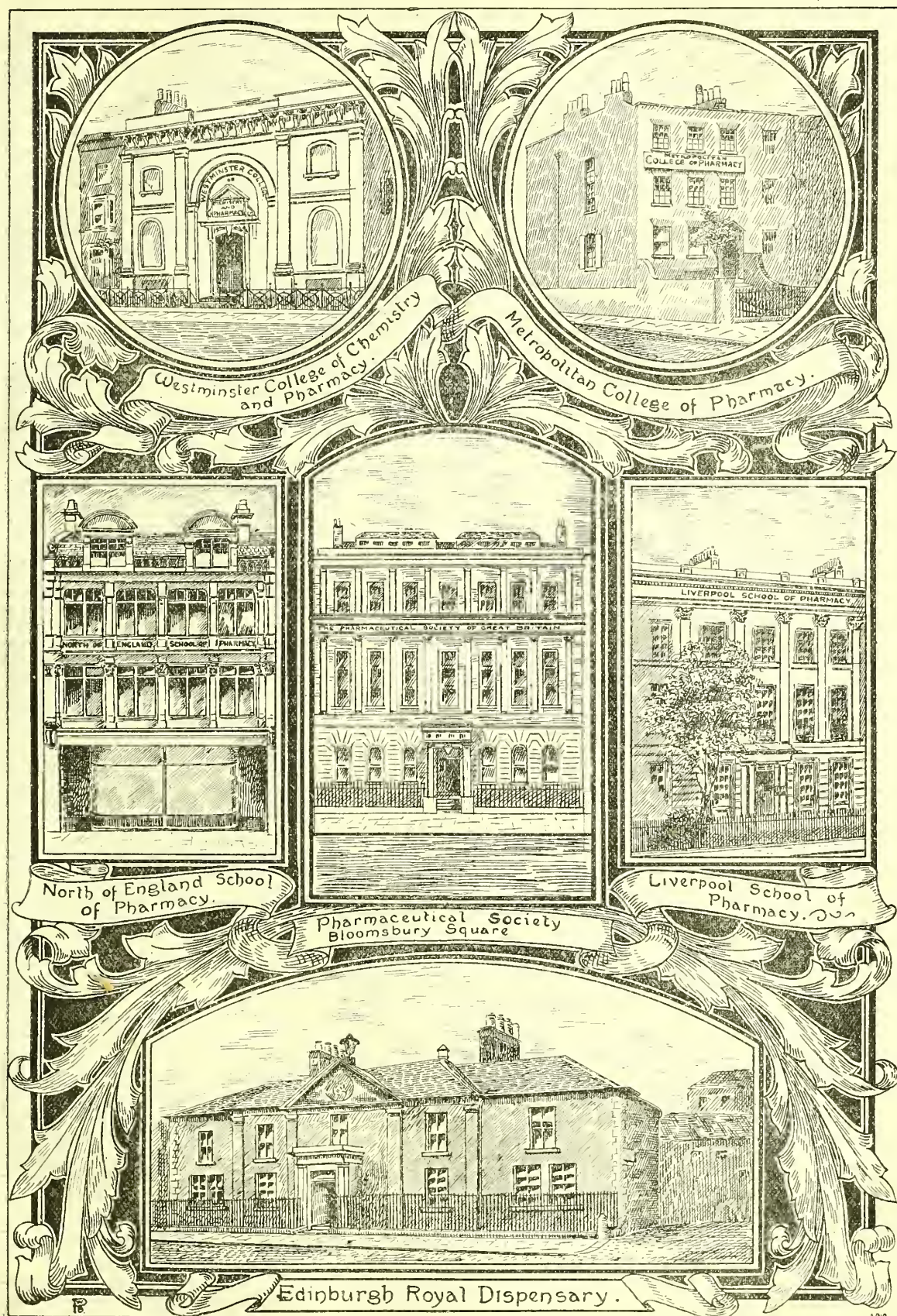
the first day, sometimes on the second. The following are typical questions:—

1. What are the botanical and geographical sources of asafetida? State what you know respecting its collection, and describe its constituents.
2. In what plants does caffeine occur? Give a method for its extraction, and describe tests for its identification.
3. What is iudigo? From what plant is it derived, and how may it be prepared?
4. How is essential oil of lemon prepared? Name and describe its chief constituents.
5. Discuss fully the official method for the estimation of morphia in opium, giving reasons for each step of the process.
6. Give the botanical sources and describe the physical and chemical characters of the following:—Berberine, homatropine, picrotoxin, thymol, cathartic acid.

Candidates are admitted to the second or practical portion of the examination if they pass the written portion, not otherwise.

TEXT-BOOKS.

The choice of text-books by students of pharmacy is a matter of considerable importance. Some students (we hope they are few) sell their books as soon as they get their certificate. We regard such men in the same light as we would regard the man who "cuts" his mother. Books are one's best friends, and a wholesome love for them is a precious possession. Therefore, we counsel all now beginning their studies to treat this matter seriously, and to select books which may be useful to them always, and which they need never be ashamed to show. In regard to the elementary science text-books, the local teacher always gives advice, and it is best to follow it. Here we shall only note books of general interest, and which we know to be reliable. For chemistry, the old-fashioned in style but up-to-date in fact "Elementary Manual" of Sir H. E. Roscoe (Macmillan, 4s. 6d.) is good reading, but we prefer for several reasons Ramsay's "Elementary Systematic Chemistry" (Churchill, 4s. 6d.). It has not become so popular amongst pharmaceutical students as Thorpe's "Metals and Non-metals" (Collins, 6s.), or even Fownes-Tilden's "Chemistry" (Churchill, 8s. 6d.), but it has the decided advantage of bringing in now and then experiments to make clear difficult parts of the text. Thus it is good for home-study. Those who intend to go forward to the Major require a fuller book, and Thorpe's will serve their purpose well; while for organic chemistry we cannot recommend a more suitable work than Perkin and Kipping's (Chambers, 6s.). Practical chemistry offers a large choice of text-books. Attfield's "Chemistry" (Gurney & Jackson, 15s.) is a classic, which everyone connected with the trade gets sooner or later; but if the student's purse cannot go to that, Clowes and Coleman's "Elementary Qualitative Analysis" (Churchill, 2s. 6d.) will suit him admirably, as it covers the Minor work, and such as is given in our "Corner for Students;" for the practical work of the Minor and Major exclusively, Muter's book (Simpkin, 6s. 6d.) is really all that is required, and there are some excellent processes in it. For a wider knowledge of the theories of chemistry, Major students may read Meyer's "Outlines" (Longmans, 9s.), and for physics, Everett's book (Blackie, 3s. 6d.) or Ganot's "Physics" (Longmans, 15s.). In botany, Bentley's Manual, now undergoing revision by Professor J. R. Green. The first part of it, "Morphology and Anatomy" (Churchill, 7s. 6d.), is adequate for both Minor and Major students, except that the latter require to study systematic botany, a part which may be taken from the old Manual until the new one is ready. The only other books required in this subject are to assist in practical or field work. Oliver's "Botany" (Macmillan, 4s. 6d.) is a favourite of ours, but is not much used by pharmaceutical students. It gives good advice regarding the collection and preservation of specimens; so, too, does Holmes's "Botanical Note-book" (Christy, 3s.). We also recommend to those who wish to go in thoroughly for practical botany Professor Bastin's "Laboratory Exercises," published by Saunders, Philadelphia, at \$2.50, or Bower's books on "Practical Botany," published by Macmillan, the small one for beginners being excellent for Minor students, and cheap. For *materia medica*, Scoresby-Jackson's book, edited by Hill and Stockman (Thin, 12s. 6d.) is one of the best; but there are many errors in it, and, on the whole, for Minor students there is nothing so compact and reliable



as Southall's "Materia Medica" (Churchill, 5s.). Will's is a favourite, but is out of print. Major men require "Pharmacographia" (Macmillan, 21s.) and Squire's "Companion," or the "Extra-pharmacopœia," for new remedies. The selection of *pharmacy* books is not large. Cripps's "Galenic Pharmacy" (Churchill, 8s. 6d.) has become popular, although the School of Pharmacy still sticks to Proctor's "Lectures" (Churchill, 14s.), which is quite a classic. The "British Pharmacopœia" (Spottiswoode, 6s.) is, of course, essential. The *Addenda* costs 1s. and should be read. For dispensing-work "The Art of Dispensing" (3s. 6d.; published at the offices of this journal) is the recognised text-book.

CHANNEL ISLANDS PHARMACY.

There is no pharmacy law in Jersey, and anyone may practise it there with or without a qualification. Not so in Guernsey. An ordinance had been in existence there for more than ten years, under which anyone who wished to open a pharmacy in the island had to apply to the Court of Jurats and submit an English or French certificate showing that they were qualified to practise pharmacy. This regulation has recently been altered to enable those holding the Irish diploma to practise in the island; at least, such was the intention, but the regulation actually reads—

"None shall be able to exercise the profession of chemist or physician, neither to prepare, sell, or retail any medicament in this island, without having been admitted by the Court, and this after presenting a diploma of the Pharmaceutical Society of England or of the Faculties of France.

In Guernsey they seem to consider "England" the equivalent of "United Kingdom." There are certain medicines exempted from the ordinance, viz.:—Castor oil, cod-liver oil, seidlitz powders, vaseline, alum, bicarbonate of soda, Epsom salts, senna leaves, cream of tartar, tartaric acid, citric acid, magnesia, saltpetre, borax, carbonate of ammonia, and sulphur. These may be sold by anyone. It will be observed that the Pharmaceutical Society of Great Britain has local secretaries in the islands, Guernsey and Jersey being "First" examination centres.

ISLE OF MAN.

There is no pharmacy law in this island, and, although most of those in business there hold the British qualification, it is not essential; in fact, for some time it was a dumping ground for "Minor" failures, yet most of those in business in the Isle of Man hold the British qualification, and the public respect it.

APOTHECARIES' ASSISTANTS' CERTIFICATE.

This is not a registrable qualification, and is not recognised by law in any way. It is of little value outside London, where certain hospitals regard it as sufficient qualification for dispenserships. The Local Government Board for England and Wales have also accepted it as qualifying for dispenserships in union workhouses, &c. The certificate authorises the holder to act as an assistant (to an apothecary) in compounding and dispensing medicines. The examination is held by the Examiners of the Society of Apothecaries on the fourth Wednesday of the months of January, March, May, July, September, and November, at 2 P.M., and consists of two parts: (a) Practical—the compounding and dispensing of medicines. (b) Oral—the translation of prescriptions; chemistry; the materia medica and pharmacy of the drugs, a schedule of which may be obtained from the Secretary. Candidates must give notice, and pay the fee, 2 guineas, seven days before the examination is held. Candidates failing to pass in practical pharmacy are not allowed to proceed further. All communications in regard to the examination should be addressed to Mr. Frank Haydon, L.R.C.P., Secretary to the Court of Examiners, Apothecaries' Hall, Blackfriars, E.C.

PHARMACEUTICAL EDUCATION.

Having so far dealt with the British examination requirements, we now proceed to indicate briefly where education adapted to the examinations or the life-requirements of the

pharmacist may be obtained. It should go without saying that education should be finished, not begun, at these schools. The reverse is unhappily too often the case, with the result that the failures in the examinations are heavy, and many a young fellow feels heart-broken. Again, we commend all to begin their studies early, and, although they may only learn a little here and a little there, it will all count in the examination-rooms and in the battle of life.

We here divide educational establishments into two classes—first, those which are schools of pharmacy and nothing else, which, in short, make it their business to educate students on the lines of the examination schedules; the second class consists chiefly of local ventures started or patronised by pharmaceutical associations. These, generally, are admirably suited for apprentices and assistants preparatory to that final "grind" which nine out of ten students of pharmacy take before entering for the examination. It will be understood that we cannot advise students as to which school they should actually select, but we may lay down two principles for their guidance:—

(1) Locality will in most cases decide the problem of selection so far as provincial students are concerned. The schools in the Midlands, North of England, and Scotland, give excellent facilities by part-time and other classes for preparing for the Minor.

(2) *Kudos* attaches to certain schools, chiefly the oldest. Thus, men with good brains who have aspirations for the higher things of pharmacy, and who are prepared to pay well for their education, should go to the Pharmaceutical Society's school, for the majority of the best men in the trade (we mean those "best" who take an active interest in pharmaceutical affairs) have been educated there. It would, however, be useless for those who merely want a few months' grind to go there.

For those who enter a school without previous knowledge—that is, without systematic training in the science subjects of the Minor examination—at least four months' study is required, and in most cases six months in the school is the safe course. The man who takes the shorter one and fails has another three months to go before he can get into the examination. Better to take the longer course and be sure. This is the principle upon which Scotch students work, and the reason why passes are not so numerous in London as in Edinburgh.

SCHOOL OF PHARMACY,

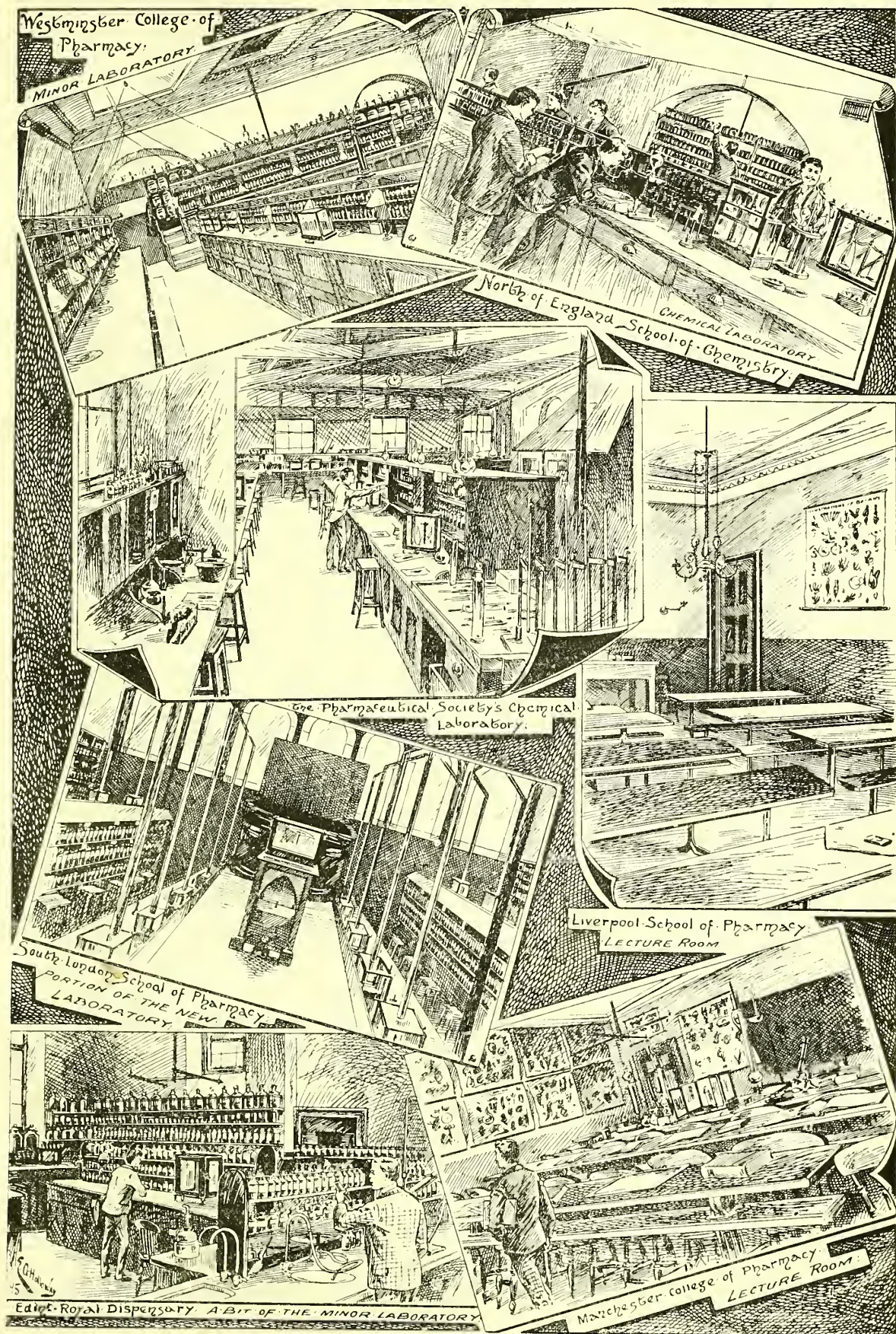
17 Bloomsbury Square, London, W.C.

Most of those who enter this school intend to take the complete curriculum, extending from October to July. For convenience, however, the session is divided into two courses—the first covering the Minor, and occupying the winter months (October to March); the second is in Major subjects, beginning in the third week of April and continuing until the end of June. Students may enter at any time, and the professors try to make up privately for what they miss of the lectures. This applies to nearly all schools. But we do not believe in the "enter at any time" theory; it is bad business, and particularly bad for the student. The Bloomsbury School has few "enter at any time students," except in the practical work (chemistry and pharmacy). The education of the Square is imparted in lectures, delivered, as a rule, between 9 and 10 in the morning, followed by tutorial classes and practical work in botanical, chemical, and pharmaceutical laboratories. The only drawback is the want of a principal, who would see that the student has continuous and regulated work. At present he may take what subjects he likes, for the lecture-fees are, e.g., for the individual subjects in the Minor course:—Chemistry, 4l. 4s.; practical chemistry (three hours daily), 10l. 10s.; botany, 3l. 13s. 6d.; materia medica, 2l. 2s.; pharmacy, with practical work, 5l. 5s., without, 3l. 3s.; altogether, say 24 guineas. Another 13 guineas covers the work for the Major examination. The Secretary of the school is Mr. E. J. Eastes, F.I.C. The session begins on October 2.

SOUTH LONDON SCHOOL OF PHARMACY (LIMITED),

325 Kennington Road, London, S.E.

This is a well-appointed and reputable institution, founded in 1868, and conducted by most efficient lecturers, and demonstrators who have had not less than ten years'



SCHOOLS OF PHARMACY INTERIORS.

experience in teaching pharmaceutical students before their appointment. In proof of what we have already said regarding the study necessary for the Minor, we quote from Dr. Muter's prospectus:—"Candidates presenting themselves for the Minor must be up to the standard for the former Major. To do this, where men have not previously studied, means daily work for six months. The days of 'one-term courses' for the Minor are now over." The school charges a perpetual fee of 5*l.* 5*s.* for lectures in all the Minor subjects, and 2*l.* 12*s.* 6*d.* per month for the practical work (botany, chemistry, and pharmacy); or the fees may be compounded by paying 12*l.* 12*s.* for a three and a half months' course, and 8*l.* 8*s.* for each subsequent course, both theoretical and practical, this applying to Minor and Major students. The courses begin on September 23 and January 2, but students who have worked before may enter between times, in regard to which they should address the Secretary.

WESTMINSTER COLLEGE OF CHEMISTRY AND PHARMACY,
Trinity Square, London, S.E.

Messrs. Wills and Wootton, directors of this school, state that, since it was established in 1872, upwards of 3,000 students have qualified from it. This statement seems to apply to students of all grades; but there is no doubt of the fact that more Minor men have studied at this school than at any other. The average is about one hundred a year, the school having reached its highest point in 1891, when 156 Minor men passed from it; the passes fell to 60 in 1892, but crept up to 88 in 1893, and to 100 in 1894. Four courses of lectures are delivered during the year, beginning in January, April, August, and October. The fee for lectures and practical work is 8*l.* 8*s.* for three months, and 12*l.* 12*s.* for six months. Classes are also held daily for Preliminary students (fees 3*l.* 3*s.* for three months' course), and there are evening lectures and practical work in all subjects. Major students are also taken, but we observe the names of three only as having passed from the school in 1894. Secretary, Mr. E. Walden.

METROPOLITAN COLLEGE OF PHARMACY,
162 Kennington Park Road, London, S.E.

Although only two years old, this college has taken front rank amongst the metropolitan schools. There are three terms for Minor and Major in the course of the year. The first commenced on Monday last (September 2), and concludes in time for the January examination, immediately after which another commences, and the third after the April examinations. Each course, therefore, extends to 3½ months, and the fee is 10*l.* 10*s.* for the Minor and 6*l.* 6*s.* for the Major, with a reduction for longer periods. Evening classes are a feature of the college. Secretary, Mr. Walter S. Carver.

NEWINGTON COLLEGE OF CHEMISTRY AND PHARMACY,
26 and 28 Newington Causeway, London, S.E.

Mr. Frederick Davis's system of education at this school is entirely tutorial, and all the subjects of the Minor and Major are taught. Fee for the course (which may begin any time), 10*l.* 10*s.*

OTHER LONDON SCHOOLS.

Middlesex College of Chemistry, 40 Charlotte Street, Portland Place, W.—Pharmaceutical students are received here, as well as medical students and nurses.

City School of Chemistry and Pharmacy (Limited), 27 Chancery Lane, W.C.—For three months' Minor course, 8*l.* 8*s.* Evening and Major classes are held.

For science schools in London where evening work may be done, see the list under Science, page 398.

LIVERPOOL SCHOOL OF PHARMACY,
6 Sandon Terrace, Upper Duke Street, Liverpool.

Mr. R. C. Cowley, the principal, has succeeded in maintaining the more than local reputation which the late Mr. Ward, the founder of the school, created for it. The first full-term class for the Minor begins on Monday next, September 9, and concludes in time for the January examina-

tion; fee, 10*l.* 10*s.* The courses beginning in January and April are a guinea less. Once a week classes are held on Wednesdays from 3 to 10 P.M. (juniors), and Tuesdays (advanced) at the same hours; fee for the whole session, 7*l.* 10*s.* A student beginning this class now should be ready for the examination in July. The system of instruction appears to us to be intelligent and thorough. Major students are taken; fee 9*l.* 9*s.* for 3½ months' course.

THE OWENS COLLEGE, MANCHESTER.

There is a pharmaceutical course at this college, in which the professors of science are associated with two pharmacists. The plan of study is based upon that of the School of Pharmacy at Bloomsbury Square. The Minor course, beginning in October, costs only 13*l.* 13*s.* The Major course begins in May. The school has never been well supported. From our knowledge of the teachers, and inquiries regarding the instruction, we think this is a mistaken neglect.

MANCHESTER COLLEGE OF PHARMACY,
225A and 227A Oxford Street, Manchester.

Mr. Charles Turner has, since the retirement of his brother, Mr. W. Spencer Turner (the founder of the college), taken entire charge, but is assisted by a pharmaceutical chemist. The session began on August 19. Fees to the January examination: Minor, 11*l.*; Major, 5*l.* 10*s.* That is for the full-time classes, which occupy the day from 9.30 A.M. to 4.30 P.M. The next terms begin in January and April; Minor fee, 9*l.* 9*s.* The local classes are—(1) Once a week (Tuesdays, 2 to 9 P.M.); fee, 4*l.* 4*s.* for six months; and (2) evening; fee, 5*l.* 5*s.* for six months. The Major fees are lower. Mr. Turner has taken a hint from the late Professor Maisch by introducing an optical lantern into his classes, whereby the general appearance of plants as well as their structure is shown on an 8-foot disc—an admirable feature.

NORTHERN COLLEGE OF PHARMACY,
100 Burlington Street, Manchester.

Mr. George Clayton receives here pupils for the Minor and Major. Minor students may enter for the day class, a term of which commenced this week; fee, to January, 10*l.* 10*s.* Terms also begin in January and April; fee, 9*l.* 9*s.* The afternoon class (six months; fee, 5*l.* 5*s.*) and evening class (same fee) also begin now. There are day and evening classes for the Major, the fees being almost half of those for the Minor. Mr. Clayton has made his school a success, and has secured the affection of his men.

NORTH OF ENGLAND SCHOOL OF CHEMISTRY AND PHARMACY,

55 Northumberland Street, Newcastle-on-Tyne.

Mr. George F. Merson, the principal of this school, sticks to the old "examination to examination" arrangement in his classes, each course of tuition commencing in the second weeks of January, April, July, and October. There are four kinds of classes:—(a) Full time, meets daily (except Saturdays) at 9.30 A.M.; fee, 6*l.* 6*s.* (b) Evening, meets three times a week at 7.30; fee, 3*l.* 3*s.* (c) Wednesday afternoon; fee, 3*l.* 3*s.* (d) A special weekly class for junior assistants and apprentices; fee, 1*l.* 1*s.* for each subject, or 3*l.* 3*s.* for all. The fees are, in each case, per quarter. Day and evening classes are held for the Major, and pupils are taken for the Preliminary also. Mr. Merson also coaches medical and veterinary students.

NEWCASTLE-ON-TYNE PHARMACEUTICAL COLLEGE,
35 Grainger Street, Newcastle.

Sessions begin after each examination; fees in day and evening classes same as at the North of England School.

SHEFFIELD COLLEGE OF PHARMACY,
118 Princess Buildings, The Moor, Sheffield.

Messrs. Greaves and Turner begin courses of tuition on October 2; on January 7, April 7, and July 15, 1896, in each case for the Minor and Major examinations three months after. They also have short courses for the same examinations, intended for those who have been in before or who

are well up. The Minor fee is 9*l.* for the full course, and 5*l.* for the short; Major, 7*l.* and 4*l.* 10*s.* The school has virtually replaced the local societies' efforts.

ROYAL DISPENSARY,

21 West Richmond Street, Edinburgh.

A school of pharmacy was started here about twelve years ago by Mr. J. Rutherford Hill, and, on his appointment as assistant secretary to the Pharmaceutical Society, Mr. William Duncan succeeded him, and has continued and developed the school with signal success, having got through 600 Minor men in eight years, the most notable provincial success. Three complete courses are held during the year, commencing in October, January, and April, day and evening classes being held. The evening classes begin in September and February. Fees for the former 8*l.* 8*s.*, and for the latter 3*l.* 3*s.* per three months' course in Minor or Major subjects.

CENTRAL SCHOOL OF PHARMACY,

26 Clyde Street, Edinburgh.

Mr. William B. Cowie and Mr. Alexander Johnstone opened this school on September 2 for preparing candidates for the Minor and Major. The day course will begin on October 2; the fee for Minor and Major students is 8*l.* 8*s.* Evening classes are held three times a week from 8.30 to 10.30; fee, 3*l.* 3*s.* per quarter. Preliminary examination classes will be conducted by Mr. Alexander Cameron; fee, 1*l.* 1*s.* per quarter.

CENTRAL SCHOOL OF CHEMISTRY AND PHARMACY,

196 St. Vincent Street, Glasgow.

Mr. Thomas Mackenzie, the principal of this school, is the man who wrote to THE CHEMIST AND DRUGGIST telling students how to get through the Minor and Major by self-study, and the result has been that Glasgow men want more of him, which he is giving them in day and evening classes—the day (Minor), 8*l.* 8*s.*, and evening, 3*l.* 3*s.* per quarter. The Major fees are less. The educational system is well thought out, and is arranged in junior and senior sections.

SCHOOL OF PHARMACY,

180 West Regent Street, Glasgow.

Mr. David Lees, pharmaceutical chemist, has evening classes at the above address, beginning on October 10 at 9.30 P.M. There are junior and senior divisions; fee, 3*l.* 3*s.*, exclusive of laboratory teaching. Day classes are also held, but Mr. Lees should be addressed in regard to these.

PROVINCIAL ARRANGEMENTS.

We note here only those arrangements for pharmaceutical students which have been made by local associations, or which local science schools have specially made for students of pharmacy. There are, however, few large towns in the kingdom in which technical education is not well looked after, and wherein those connected with pharmacy cannot get preliminary education in science. Some of these are noted in the Science section. As we have already said, full advantage should be taken of such arrangements by apprentices and assistants between their sixteenth and twentieth years, after which it is desirable to specialise the studies according to the Minor schedule.

Aberdeen. The Aberdeen and North of Scotland Society

of Chemists and Druggists recommend local students to attend the botany and chemistry classes at Robert Gordon's College. There is a laboratory at the Society's rooms specially fitted for the use of students, and the free use of this may be obtained on application to Mr. Strachan, 138 Rosemount Place, Aberdeen.—The Aberdeen School of Pharmacy, 21 Bridge Street, commences on Monday, October 1, with a preparatory class. There is also an advanced class. Messrs. William Pennie and Robert Glegg are the teachers.

Birmingham. The capital of the Midlands affords excellent facilities for students of pharmacy. Mason College is available for those within a wide radius of Birmingham, as students of the college under 18 years of age get from the various railway companies season-tickets at

half the usual rates. In the science department Professor Percy F. Frankland, a pharmaceutical examiner, gives a general course of lectures on chemistry at 9.30 A.M. daily (except Fridays and Saturdays) from October to March, the fee for both terms and a weekly tutorial class being 5*l.* 5*s.* The summer term (April to June) is devoted to organic chemistry, and is suitable for Major students; fee, 1*l.* 11*s.* 6*d.* The laboratory affords good opportunity for working, three hours a day, three days a week, being charged 2*l.* 12*s.* 6*d.* Professor Hillhouse lectures on general botany on Wednesdays and Fridays at 11.30 A.M. during the spring and summer terms (fee, 2*l.* 2*s.*), and on systematic botany during the summer term (fee, 1*l.* 1*s.*). These particulars refer to the junior course. There are "middle" and senior courses, for particulars of which the syllabus of day classes should be referred to. The Queen's Faculty of Medicine has a materia medica and pharmacy section, in which Mr. John Barclay, B.Sc., pharmaceutical chemist, is lecturer. On Tuesdays at 12, from May to July, Mr. Barclay has a lecture course, which embraces a systematic exposition of the materia medica and preparations of the British Pharmacopoeia, illustrated by exhibitions of the various drugs and their derivatives, and instruction by demonstrations in the commoner pharmaceutical processes. This is specially adapted to medical and dental requirements, but is good for students of pharmacy also; fee, 1*l.* 1*s.* A practical class meets in the pharmaceutical laboratory on Wednesdays or Fridays at 2 P.M. from May to July; fee, 10*s.* 6*d.* Evening classes are also held at Mason College; and excellent instruction is also afforded at the Municipal Technical Institute, Paradise Street, Mr. George Mellor, secretary.

Mr. F. H. Alcock, Temple Chambers, Broad Street Corner, receives pupils for all the pharmaceutical examinations. The fees are *pro rata*, according to the time required. The work of Minor and Major students is thoroughly practical, and done by the students themselves under the teacher's immediate supervision. Each student works independently and can begin at any time.

Mr. F. Stokes Dawson, of the Central School of Pharmacy 90 New Street, prepares students for Major, Minor, and Preliminary examinations. The day and evening classes for Minor and Preliminary are continuous. Practical pharmacy and dispensing receive special attention.

Brighton. The local chemists' association encourages apprentices and assistants to attend the evening science classes by offering special prizes for competition, for particulars of which inquirers should apply to the Secretary.

Dundee. At the University College efficient instruction in botany (by Professor Patrick Geddes, one of the pharmaceutical examiners) and chemistry by Professor James Walker, in day classes. To these reference is made under "Science" (p. 398). At the Science and Art classes held at the Y.M.C.A., Mr. J. Braik Mason lectures on the various branches of chemistry, elementary inorganic being taken on Friday evenings at 8.30. A botany class meets on Wednesdays at 7.30 P.M.; fee for two classes 7*s.* 6*d.*, or 5*s.* for one.

Edinburgh. Students of pharmacy have been in the habit, especially during their junior days, of attending the chemistry lectures and laboratories at the College of Surgeons (Dr. Stevenson Macadam) and Minto House (Mr. Falconer King), tickets for them at reduced rates being obtainable from Mr. J. Rutherford Hill, 36 York Place, Edinburgh. Of late years, however, the instruction given in the day and evening classes at Heriot-Watt College has somewhat influenced the popularity of the older institutions. Dr. John Gibson, a pharmaceutical examiner, is the professor of chemistry at the college, and the instruction given in this subject has been much taken advantage of by students of pharmacy. Botany and physics are also taught.

Those for whom these classes are particularly suited are apprentices who have yet several years to wait before they can enter for the "Minor."

Leeds. The technical school connected with the Mechanics' Institute, Leeds, has for years been the training-school for students in pharmacy desirous of gaining a knowledge of elementary and practical chemistry, physics, botany, and allied sciences. The prospectus for the coming session, September to May, issued by Mr. J. Harris,

B.Sc., head-master, shows that the following classes will be carried on:—Elementary theoretical inorganic chemistry, Thursday, 7 to 8.30 P.M.; theoretical organic chemistry, Wednesday, 7 to 8.15 P.M.; elementary botany, Friday, 8 to 9 P.M. Fee for any of these, 2s. 6d. for a course of thirty lectures. Practical inorganic and organic chemistry, elementary and advanced, with laboratory practice, Friday, 7 to 10 P.M. Fees, elementary, three hours per week through the session, 7s. 6d.; advanced, 4½ hours per week, 12s. 6d. All materials found. Practical physics, Tuesday, 7.30 to 8.30, or 8.30 to 10 P.M. In practical chemistry instruction is given in Attfield's "Chemistry," and every facility given for acquiring a knowledge of volumetric analysis. A syllabus of the lectures, &c., may be obtained from the Secretary.

The College of Science admits students of pharmacy on special terms. Formerly a pharmaceutical curriculum was arranged here, but, owing to inadequate support, the course had to be abandoned.

The Nottingham and Notts Chemists' Association, continuing their arrangement with the local University College, announce that the part of the three years' course of instruction in subjects for the Minor will next session include a course of twenty lectures on pharmaceutical chemistry, which will be delivered at the College by Mr. R. M. Caven, B.Sc., at 8 o'clock on Tuesday evenings, commencing on October 8.; fee, 15s. per term. A course of lectures on elementary organic chemistry will be given in the third term at 8 o'clock on Thursday evenings by Dr. J. J. Sudborough; fee, 7s. 6d. In materia medica a course of about twenty-five lectures will be given by Mr. C. Haydon White, M.R.C.S., on Thursday evenings at 8.30, commencing on October 10; fee, 15s.; and a course of twelve class-lectures and laboratory practice in physics will be given by Professor Heaton, M.A., in the third term, on Tuesday evenings at 8 o'clock; fee, 5s. Tickets may be obtained from Mr. R. Fitz-Hugh, Mr. J. Wilford, or from the honorary secretary, Mr. Albert Eberlin, 2 Chapel Bar, Nottingham. The classes are open to those only who are associates of the local association. The scheme is an excellent one, and is the only successful local-association effort in pharmaceutical education in the kingdom.

Lectures on materia medica are delivered to the members of the junior section of the local Society by Mr. Turney, and the sciences may be studied in evening classes.

The Sheffield Pharmaceutical and Chemical Society, Surrey Street, Sheffield, make arrangements for teaching botany, chemistry and materia medica, but the classes have been somewhat under a cloud during recent years. For particulars apply to Mr. J. F. Eardley, 265 Glossop Road, Sheffield.

In THE CHEMISTS' AND DRUGGISTS' DIARY, pp. 216-7, is a list of local pharmaceutical associations in Great Britain. Should any student be in the hapless condition of having no one to advise him, the secretaries of these associations may be applied to. They are all amiable persons, who are willing to promote the good of pharmacy by keeping young men on the right path.

Messrs. Wills and Wootton, Westminster College, Borough, S.E., and Mr. John Tully, of Hastings, have arranged systems of instruction by post for preliminary and Minor students, the College also having a course for Major students. These provide good directions for those pursuing their studies at home. For particulars in regard to them we refer inquirers to the advertisements.

IRELAND.

The sale of poisons is regulated in Ireland by several Acts of Parliament, which restrict the sale to (1) pharmaceutical chemists, (2) chemists and druggists or registered druggists, and (3) apothecaries and registered medical practitioners. Further, a Pharmacy Act passed in 1875 makes it illegal for any but pharmaceutical chemists, apothecaries, and registered medical practitioners to compound medical prescriptions. In Great Britain pharmaceutical chemists and chemists and druggists are on exactly the same footing

so far as trading is concerned; but it is not so in Ireland, the druggist there having a much lower qualification, and his privileges are restricted to the sale of poisons—compounding of these and non-poisons alike being denied to him. This grade of traders was created by an Amendment Act passed in 1890. For the title

REGISTERED DRUGGIST

this Act makes it necessary that all who apply for it shall have completed four years' service as apprentice or assistant to a pharmaceutical chemist, or to a licentiate apothecary, or to a registered chemist and druggist, or registered druggist. When the Council of the Pharmaceutical Society of Ireland is satisfied that the candidate's declaration on this point is correct, and he has paid an examination-fee of 2l. 2s., he is admitted to an examination held in Dublin, Cork, and Belfast, the subjects of which are laid down by the Act, viz.:—"English orthography and composition, arithmetic, and the weights and measures of the British Pharmacopœia, the appearance and properties of the various drugs and chemicals in general use, and the Act of the session of the thirty-third and thirty-fourth years of the reign of her present Majesty, chapter 26 (i.e., the Sale of Poisons Act (Ireland), 1870)." If the candidate passes the examination he pays a further fee of 2l. 2s. for registration. All applications in respect to this or other examinations should be addressed to Mr. Arthur T. Ferrall, registrar, 67 Lower Mount Street, Dublin.

L.P.S.I.

The licence of the Pharmaceutical Society of Ireland is in Irish pharmacy what the Minor certificate is in Great Britain, and although to a certain extent the examinations are similar, the Irish Society has the unique requirement of a curriculum in botany, chemistry, and materia medica. There are two examinations for the licence—viz., the Preliminary and the Licence. The former examination was at one time open to persons of a certain age who had served a prescribed period in a pharmacy, but this restriction is now removed; nevertheless, the candidate must still submit a certificate of birth when applying. The examination is held at Dublin on the first Mondays of January, April, July, and October, at 11 A.M., and candidates must pay the fee of 2l. 2s. into the Bank of Ireland to the credit of the Society, and forward the receipt to the Registrar with the application at least fourteen days before the day on which the examination is to be held, at the same time naming the optional subject or subjects which he or she selects. The following are the subjects of examination:—

Latin.—To translate into English, and parse sentences from a Latin author:—Caesar's "Commentaries," First Book; or Virgil's "Æneid," First Book.

English.—English grammar, including orthography and parsing. To write on a subject selected by the examiner, and to write from dictation.

Arithmetic.—The first four rules, simple proportion, vulgar fractions, and decimals. To describe the British weights and measures and the metric system.

Algebra.—As far as simple equations, inclusive.

Geometry.—Including the first book of Euclid.

The candidate must pass in one, at least, of the following optional subjects:—

Elementary Physics and Mechanics.—Sound, light, and heat, as given in Ganot's "Elementary Course of Natural Philosophy"; mechanics of solids and fluids, comprising the elements of statics, dynamics, and hydrostatics.

The Rudiments of Botany.—Oliver's "Lessons in Elementary Botany," Part I.

Elementary Chemistry.—As included in Roscoe's "Lessons in Elementary Chemistry," chapters 1 to 13, inclusive.

French, German, or any modern language.

Candidates must obtain 50 per cent in English, arithmetic, and the British and metrical systems of weights and measures; 40 per cent. on the entire course; and not less than 20 per cent. in each of the other compulsory subjects.

In lieu of this examination the Society accepts any of the examinations accepted by the General Medical Council and the Preliminary examination of the Pharmaceutical Society of Great Britain, if the examination has been passed at least one year before the candidate presents himself for the

Licence examination. The usual fee of 2l. 2s. must be paid. Candidates for the licence of the Society must be 21 years of age, and have passed the Preliminary examination. They must also show that they have for four years been engaged as apprentice or assistant, and in the sole employment of a pharmaceutical chemist, registered chemist and druggist of Great Britain, or apothecary; or four years with a chemist and druggist or registered druggist of Ireland, and two years with either of the before-mentioned, provision being made for service with one or more or with firms. The candidates must also show by certificate that they have attended a course of practical chemistry, of not less than three months' duration (100 hours), in the laboratory of one of the following institutions, and a course of botany and materia medica:—

- The School of the Pharmaceutical Society of Ireland.
- The School of the Pharmaceutical Society of Great Britain.
- The Cecilia Street School of Medicine, Dublin. (Chemistry only.)
- The City of Dublin Technical Schools. (Chemistry only.)
- The City School of Chemistry and Pharmacy (Limited), Chancery Lane, London, W.C. (Chemistry only.)
- The Government School of Science, South Kensington. (Chemistry only.)
- The Queen's College, Belfast. (Chemistry only.)
- The Queen's College, Cork.
- The Queen's College, Galway.
- The Royal College of Science for Ireland, Dublin. (Chemistry only.)
- The Royal College of Surgeons in Ireland, Dublin. (Chemistry only.)
- The Working Men's Institute, Belfast.
- Trinity College, Dublin. (Chemistry only.)
- Anderson's College Medical School, Glasgow. (Chemistry only.)
- Mr. S. Templeton's School, Belfast.
- The School of Physic, Trinity College, Dublin. (Botany and materia medica only.)

The examination is held in Dublin on the first Wednesday and two following days of January, April, July, and October, commencing at 11 A.M. The fee is 5l. 5s., and the bank receipt for it has to be sent to the Registrar, along with the necessary declarations, fourteen days at least before the examination is held. The following are the subjects of examination:—

Botany.—To recognise the principal indigenous plants used in medicine, to refer them to their natural orders, and to give the definitions and the distinctive characters of their several parts.

Materia Medica.—To recognise specimens of the drugs of the Pharmacopœia, to describe their characters and active principles, name the sources from which they are obtained, and the official preparations into which they enter; and to detect adulterations.

General and Pharmaceutical Chemistry.—The elementary laws of chemistry and physics, including chemical equations; to recognise the chemical substances of the Pharmacopœia; to describe the processes by which they are obtained; qualitative analysis (including the tests of the Pharmacopœia) and volumetric analysis; and to submit to a practical examination in these subjects.

Practical Pharmacy.—To translate Latin prescriptions; to detect dangerous doses; to compound and dispense correctly; to explain the processes of making the non-chemical preparations of the Pharmacopœia, and to recognise them; and to have an intimate knowledge of the sale of Poisons (Ireland) Act, 33 & 34 Vict., chap. 26, 1870.

The examination lasts three days, two being devoted to written papers in chemistry, botany, and materia medica, and practical work in chemistry and pharmacy; and on the third day the survivors have a short *viva-voce* examination. The questions given in writing are printed in the Society's calendar (to be obtained from Mr. Ferrall, price 1s.), and a set of *viva-voce* questions will be found in the *C. & D.*, February 2, 1895, page 199.

Where Recognised. The licence-certificates of the British and Irish Societies are not interchangeable, so that an Irish pharmaceutical chemist cannot set up as such in Great Britain, nor a British chemist and druggist, or pharmaceutical chemist set up as such in Ireland. An Irish pharmaceutical chemist is, however, eligible to hold an appointment as poor-law dispenser in England and Wales.

Irish licentiates are permitted to act as pharmaceutical chemists in most of the colonies, including Victoria and New Zealand, without examination, on complying with the regulations of the colonial pharmacy boards; and, in the case of Queensland, if they are members of the Irish Society. They

may also register without examination in Cape Colony, and also in the following States of the North American Union, viz.:—Alabama, Arizona, Arkansas, California, Dakota (North and South), Georgia, Indiana, Indian Territory, Maryland (except Baltimore), Mississippi, Montana, Nevada, New Mexico, Oregon, Tennessee, Texas, Utah, Vermont, Washington, and Wyoming.

The Canadian provinces generally recognise the certificates of the Pharmaceutical Society of Great Britain; but they seem to consider 'Great Britain' as the 'United Kingdom,' and would doubtless accept the Irish certificate also on special resolution.

The school of the Society is in the premises The Society's 67 Lower Mount Street, Dublin. Professor School.

Tichborne delivers the lectures on chemistry, and is assisted in this and the practical course by Mr. P. Kelly. Particulars may be obtained from the Registrar. The lectures on botany and materia medica are given by Professor Ninian Falkiner, M.B., assisted by Mr. Henry Dixon, B.A. There are three sessions each year, viz.:—January 1 to March 31, April 1 to June 30, October 1 to December 31. During the session twenty-six lectures are delivered, on Tuesdays and Thursdays, at 8 o'clock P.M. The student must attend at least twenty lectures of a course, to qualify him to receive the certificate. The fee is two guineas.

ASSISTANTS' CERTIFICATES.

An examination for an apothecaries' assistants' certificate has long been held at the Apothecaries' Hall, Mary Street, Dublin, for those above 16 who have two years' experience in pharmacy. The subjects of the examination are theoretical and practical pharmacy, materia medica, the British Pharmacopœia, and the translation and compounding of medical prescriptions. Fee, 27s.

The Pharmaceutical Society of Ireland obtained powers in 1890 to hold a similar examination. The conditions of entry are exactly the same as for the Licence examination (excepting the curriculum), but the fee is 1l. 1s. Examinations are held on the second Mondays of January, April, July, and October, at 11 o'clock, the subjects being—

Prescriptions.—Candidates will be required to read autograph prescriptions, translate them into English, render a correct translation of the directions for use, and detect unusual doses.

Practical Dispensing.—To weigh, measure, and compound medicines, write the directions in suitable language, finish and properly direct each package.

Materia Medica and Quality of Specimens.—To recognise the Pharmacopœia chemicals in frequent demand, and specimens of roots, barks, leaves, fruits, resins, and gums in ordinary use; also to estimate the quality of each specimen submitted, and its freedom from adulteration.

Pharmacy.—To recognise the preparations of the Pharmacopœia which are not of a definite chemical nature, such as extracts, tinctures, and powders, and give the proportions of the more active ingredients. The candidates will also be examined in the Sale of Poisons (Ireland) Act.

MEDICINE.

It was once said, "Pharmacy is an integral part of the medical profession." The lowest part it may be; and that may account for the fact that many in the trade yearly wend their way upwards. We must recognise this tendency, for while we have for pharmacy a regard not inferior to what we have for medicine, the fact remains that either through pride of place or desire to be more useful to their fellow man, or, in a few cases, with the hope of higher gain, some desire to study medicine. The first point to be noted is that, though nearly allied in practice, the two callings are under totally distinct administrative bodies. We have seen that the Pharmaceutical Societies control the entrances to pharmacy. Medicine and dentistry are in the hands of the General Medical Council and its branches in Edinburgh and Dublin.

Courses Open. Five years is the period fixed as the minimum by the Medical Council for qualification as a medical practitioner. The whole or part of this period must be spent in an approved medical school in the United Kingdom. Here is the first point which the intending student has to face. It is not an unfortunate thing, for, as it happens, there are now few districts in the kingdom in

which the student may not at least commence medical studies. The chief point to settle is whether a simple licence or a medical degree will be sought for, and that requires quick decision, because the Preliminary examination which will do for a licence is useless, or almost so, for a degree. On the other hand, matriculation at a University is good for the preliminary stages of all licensing bodies.

English students who can should endeavour to matriculate at the London University, because that is a qualification accepted by all British bodies except Cambridge and Oxford. If anyone feels, or has proved himself, unfit for this, he should enter for the College of Preceptor's examination for medical students. Scotch students find the University examinations easy enough, and it is the simplest course to take them rather than attempt to wriggle through by some back way, a proceeding which the Scotch University Commissioners have lately been doing their utmost to discourage. For the Scotch licences the Educational Institute conducts a Preliminary examination, which is also accepted by the Royal College of Veterinary Surgeons. Irish students are recommended to pass the Matriculation or First examination of the Royal University.

Cost. We cannot put down the cost of education and training as a medical practitioner at less than 500*l*. Some do it for much less, we know, and it does not follow that a man without 500*l*. should not commence medical studies; but he must see his way to finding the wherewithal before the five years are up. Some do it by holding part-time situations, assisting medical men, or sheer intellectual ability secures scholarships for others, who else find life hard living. We do not require to advise such men.

Prospects. The medical profession is said to be overcrowded. So are most callings, but "there's aye room at the tap." As a matter of fact, there has been a distinct falling-off in the entries recently, owing, doubtless, to the more stringent conditions of entry. About 1,500 new names have been added to the medical register yearly, but three years ago the number dropped by 150, and, allowing for removals, we find that the year 1893 showed an increase of 1,013 over 1892, and 1894 a further increase of 818 only. At present there are 32,590 general practitioners in the United Kingdom, distributed as follows:—

	Population	General Practitioners
London	5,634,000	5,742
England and Wales (provinces) ..	23,300,000	15,313
Scotland	4,033,000	3,224
Ireland	4,706,000	2,511

It is right that we should point out that the above figures are partly derived from the centre of qualification, so that Scotland figures higher than she actually deserves. There is as much room at the bottom of the profession as at the top, and if anyone is content to buy experience in a working-class practice at low fees, that is a way in which he can help himself and humanity more efficiently than by investing 1,000*l*. to 4,000*l*. in an old practice. It is the clever men who find it hard to live. Many of them have little business ability, and hesitate to bury themselves in a general practice; but, sinking all such considerations, there is no question that an investment of 1,000*l*. in a medical practice is one of the best things going. A clear income of 500*l*. a year is the average yield, and given a good bedside manner, fair business tact, and a measure of popularity, the income may reach 5,000*l*. in the course of twenty years.

No special privilege is offered to pharmacists entering the profession. If they have passed the British or Irish Preliminary before December 31, 1891, it is accepted to the extent of the English, Latin, and arithmetic. We may, howstate that, in a recent letter addressed to one of our subscribers, Mr. Miller, the Registrar for England and Wales, says:—"The Preliminary and Minor examinations of the Pharmaceutical Society are accepted *pro tanto*, provided you were a registered *bond-fide* medical student prior to January 1, 1892, in which case one, at least, of the above examinations will be accepted." This statement seems to us incorrect, and unauthorised by the Council. Indeed, we have before us another letter in which the contrary is stated. The Council's regulation is as we have put it, and if any student

finds difficulty in getting the Registrar to accept his certificates, his medical teachers will assist him in getting the matter put through.

THE MEDICAL PRELIMINARY EXAMINATION.

The General Medical Council does not conduct an examination, but recognises all those mentioned on pp. 375-6, provided they include the following subjects passed at one time:—

- (a) English language, including grammar and composition.
- (b) Latin, including grammar, translation from specified authors, and translation of easy passages not taken from such authors.
- (c) Mathematics, comprising (a) arithmetic; (b) algebra, as far as simple equations, inclusive; (c) geometry, the subject matter of Euclid, Books I, II., and III., with easy deductions.
- (d) One of the following optional subjects:—
- (a) Greek, (b) French, (c) German, (d) Italian, (e) any other modern language, (f) logic.

Certain conditions are attached to some of the certificates, and there is a list of colonial and foreign certificates which are under certain conditions accepted. We therefore advise intending students to obtain a copy of the pamphlet (6*d*.) from either of the Registrars named on the next page.

What to Pass. The College of Preceptors, Bloomsbury Square, London, W.C., hold in March and September each year a professional Preliminary examination in London and certain provincial centres—*e.g.*, Birmingham, Bristol, Leeds, and Liverpool; also at the ordinary examinations in June and December. Thirty days' notice must be given by candidates, but the 25*s*. fee may be paid fourteen days later to the Secretary. Candidates may enter for the First or Second Class examination; but it is customary for medical and dental students to take the latter in English language, Latin, arithmetic, algebra, Euclid (Books I, II, III.), and one of the following:—Greek, a modern foreign language, logic. A total of 550 marks must be obtained, and to assist him in reaching this figure the candidate may take other optional subjects. A paper on logic, and a second-class paper on Euclid, I-III., are set at the March and September examinations, but not at the June and December examinations. Candidates who wish to qualify at the June and December examinations must take the first-class paper in Euclid.

A list of authors to be given at the examinations may be obtained from the Secretary, and previous examination questions can be obtained from Mr. F. Hodgson, 89 Farringdon Street, London, E.C. (6*d*., by post 7*d*.). Candidates who passed in one or more of the required subjects prior to December 31, 1891, are allowed by the College to complete their qualification by passing in the remaining subjects required under the former syllabus, which were:—English language, Latin, arithmetic, algebra, Euclid (Book I.), mechanics, and one of the following:—Greek, a modern foreign language, chemistry, botany, zoology. Those holding the Minor certificate require to pass those subjects only in italics.

The Society of Apothecaries of London hold an examination in arts, at the Hall, in March, June, September, and December. To this they admit candidates who have passed one or more subjects prior to the above date, and for whom special papers in Euclid (Book I.), mechanics, chemistry, and botany are given. Candidates who have passed in any subject previous to January, 1892, may complete at one or more examinations. Candidates commencing after this date must take all the subjects at one examination. Notice must be sent to the Secretary a fortnight before the examination, together with the fee of 1*l*. 1*s*.

The Educational Institute of Scotland, 40 Princes Street, Edinburgh, holds an examination in Edinburgh and Glasgow in July and October each year; fee 1*l*. Notice to appear must be given a week before, the applicant stating which optional subjects he will take. Pharmaceutical men who hold pre-1892 certificates can complete their examination here as at the College of Preceptors. The examination is held on behalf of the Royal Scotch Colleges, and is recognised by the Medical Council.

The Conjoint-Irish Board holds a Preliminary examination in March and October each year; fee, 2*l*. 2*s*. The examinations are held at the Royal College of Physicians and Royal

College of Surgeons alternately, commencing at 10 A.M. each day. Candidates are required to enter their names with Mr. Greenwood Pim, secretary, Royal College of Physicians, 6 Kildare Street, Dublin, and pay the fee seven clear days before the examination. They must also attend in person, in order that they may sign the register, unless they reside at a distance from Dublin, when their application to be admitted may be made on a form (of which copies will be supplied by the Secretary). Candidates who have passed in some of the required subjects at other examinations previous to December 31, 1891, may complete their certificate by passing in the remaining subjects at the Preliminary examination of the colleges.

We must reserve for another section the examinations to be passed on entering a university as the regulations differ so widely. A man may pass a Preliminary examination any time before commencing medical study, but it is not until after he commences, or to be strictly accurate, fifteen days before registration as a medical student, that the curriculum is allowed to count. The first thing to do after entering a medical school is to get the class lines from the teacher, and lodge these and the Preliminary-examination certificate with the Registrar of the district—viz., W. J. C. Miller, B.A., Medical Council Office, 299 Oxford Street, London, W.; James Robertson, 1 George Square, Edinburgh; R. L. Heard, M.D., 35 Dawson Street, Dublin.

THE MEDICAL CURRICULUM.

The five years of medical study now required by the Medical Council may be divided as follows:—

First Year.—The subjects for study are biology, chemistry, and anatomy. The Medical Council allows the student to take out the lectures on biology and chemistry before registration as a medical student, but this does not reduce the length of the curriculum (see, however, Durham and Scotch arrangements). The London student may, at the end of the winter session, enter for the Conjoint Board examination in elementary anatomy and elementary biology, and at the end of the summer session the examination in chemistry and physics may be passed.

Second Year.—The student continues his practical dissections of the human body which formed part of his work in the previous year, and gets fairly into the medical subjects, anatomy and physiology taking up the whole of the winter session, and if ready the student may enter for the professional examination in the subjects in March. During the summer session the study of pharmacology and therapeutics begins, and if the student has no previous experience of pharmacy he must enter for the practical class. His initiation into the mysteries of diagnosis and hospital practice now begins, but the teachers take him into the matter gradually, for the first operation as described by Dr. Conan Doyle is, alas! but too true an exposition of an every-day hospital-theatre incident. So private tuition prepares the student for the realities of the hospital wards. It goes without saying that the anatomical work has ere this given the student nerve, and by this time he should have concluded the prescribed anatomical work, although it may be desirable to continue to dissect on favourite lines.

Third Year.—The Medical Council requires two years to elapse between the second and third professional examinations in order that the student may give his whole mind to the important subjects of the third and fourth years. In the former he attends during the winter and summer sessions lectures on medicine and surgery, midwifery, forensic medicine, and clinical medicine; and there is much practical work in pathology, midwifery, and surgery, while the hospital wards are visited daily; and if the student is proficient he may be appointed to a minor post under the clinical surgeon or physician, a clerkship, as a matter of course, falling to his share.

The fourth year is almost entirely taken up with hospital-work, or subjects which bear upon it, such as the clinical lectures and those on diseases of women, insanity, pathology, public health, ophthalmic surgery, &c. In the meantime the student must by himself attend twenty labours, and show thereby his capabilities of bringing weak humanity into the vortex of life. The end of the fourth summer session sees him in active preparation for the third professional examination, which is in medicine, surgery, and midwifery, and may be taken in one or three parts. This over,

the fifth year of study begins; but the student is now done with classes if he likes, as the whole of the fifth year may be devoted solely to hospital practice or visiting the sick along with a medical practitioner. It is customary, however, to take in this year further lectures in clinical medicine and surgery, in ophthalmic surgery, and at a fever hospital and lunatic asylum get to know something about the special subjects treated therein, the student at the same time learning how to vaccinate. These are things which he must get up. The Final examination may now be taken. It is held in a hospital, where the candidate is examined in regard to medical and surgical cases, so that it is a test of his practical training and his collegiate studies—in short, of his fitness to be trusted with the lives of his fellow-men.

Such is the course pursued in proceeding for a licence, and we may fittingly introduce here particulars of these available in the United Kingdom.

M.R.C.S. ENG. AND L.R.C.P.L.

This is familiarly known as the English double qual., and is granted to men by the Royal Colleges of Surgeons and Physicians jointly as a qualification entitling them to registration as general medical practitioners. The College diploma is of recognised value, and the majority of those who study in London prepare for it, while many in the provinces also do so, the colleges being most catholic in respect to the recognition of educational establishments. The courses in chemistry at the School of Pharmacy are, for example, recognised, and anyone who holds that school's certificate may enter for the Chemistry and Physics examination before registration as a medical student, thus giving more time in the first year to biology, anatomy, and physiology. The examinations are held in January, April, July, and October at the Examination Hall, Victoria Embankment, W.C. The student, when ready for the examination, takes his certificates of attendance on lectures to the Dean of his college, who signs the schedule on behalf of the Medical Faculty. This schedule must be forwarded fourteen days before the examination to the Secretary, Mr. F. G. Halkett, with the fee of 10*l.* 10*s.*, similar fees being paid in respect to the Second and Third examinations, and 5*l.* 5*s.* for the Final. If the candidate fail in any subject he is referred back for six months, and pays a reduced fee for re-examination. The subjects of the examinations are as before described. The questions set at the several examinations of the Board during past years may be obtained from Messrs. Taylor & Francis, Red Lion Court, Fleet Street, London, E.C., price 6*d.* each year; post free 6½*d.* There are special regulations for those holding colonial, Indian, or foreign qualifications, and for graduates of English, Scotch, and Irish Universities.

L.S.A.

The Society of Apothecaries of London, Blackfriars, E.C., grants a diploma in medicine, surgery, and midwifery. There are three examinations, the fee for each being 5*l.* 5*s.* The Primary is divided into two parts, the first comprising elementary biology; chemistry; chemical physics, including the elementary mechanics of solids and fluids, heat, light, and electricity; practical chemistry; materia medica; pharmacy and prescriptions. This examination may be passed any time after registration as a medical student. If the candidate fail in any subject he is referred only in that subject. The second part is in anatomy and physiology, and histology at the end of the first year. The Intermediate examination is also divided into two parts, and is passed at the end of the fourth year of study. Before entering for the Intermediate the candidate must produce a certificate of birth, showing that he or she is 21 years of age; a certificate of moral character; a certificate of the course of medical study; and a certificate of proficiency in vaccination, signed by a teacher authorised by the Local Government Board. The Final is taken at the end of the fifth year.

L.R.C.P. & S. EDIN. AND L.F.P.S. GLAS.

This is the Scotch triple qualification, the examinations for which are conducted by the Board of Examiners appointed by the Royal Colleges of Edinburgh and the Glasgow Faculty. The curriculum is as already described, except that the Board recommends students to study operative surgery

and diseases of children, of the ear and throat, and of the skin, along with other subjects, in the fifth year. There are four examinations—the First, Second, Third, and Final—which are held six times each year, four times in Edinburgh and twice in Glasgow. The First examination is in physics, chemistry, and elementary biology, and may be taken any time after registration as a student; fee, 6*l*. Additional fees of 24*l*. are required in the course of the five years. Synopses indicating the range of the subjects of the examination and further information may be obtained from Mr. James Robertson, solicitor, 1 George Square, Edinburgh; and Mr. Alexander Duncan, B.A., Faculty Hall, 242 St. Vincent Street, Glasgow.

L.R.C.P. & S.I.

The examinations of the Irish Conjoint Board are much similar to those of the English, but the First examination in chemistry, physics, practical pharmacy, elementary biology, and anatomy cannot be taken before the end of the first winter session, the student at the same time producing evidence that he has attended a course of (a) demonstrations and dissections and (b) lectures on theoretical chemistry during the winter; (c) practical chemistry, three months (summer or winter); (d) elementary biology and (e) physics; the last two subjects may be studied before or after registration at institutions recognised by the colleges; (f) practical pharmacy, which may be—(1) Three months' compounding in a hospital, (2) twenty demonstrations in a practical pharmacy class, or (3) a full apprenticeship of three years, or acting as paid assistant for not less than one year, in the establishment of a licentiate apothecary or of a registered pharmaceutical chemist. It is evident, therefore, that the conditions of entry in this case are more stringent than for any other diploma, and the fee is higher—15*l*. 15*s*. There are three more examinations falling as in England, and in similar subjects, the fees in respect to them being 26*l*. 5*s*. Further particulars may be obtained from Mr. Greenwood Pim, M.A., Royal College of Physicians, Kildare Street, Dublin.

L.A.H.

The Royal College of Surgeons and the Apothecaries' Hall of Ireland conjointly until July last granted a registrable diploma, but the Medical Council considered the examination insufficient, and reported accordingly to the Privy Council, the College at the same time withdrawing from the arrangement. The Hall has still power to grant L.A.H., but it does not qualify. In regard to this, however, students should apply to Mr. Robert Montgomery, M.R.C.S., Secretary, Apothecaries' Hall, Mary Street, Dublin.

Several of the Universities grant licences to practise medicine, &c., but on conditions so similar to those under which degrees are granted that the latter may be taken as a guide for the licences.

MEDICAL DEGREES.

Five Universities in England, four in Scotland, and two in Ireland have the power to grant degrees in medicine and surgery. The conditions upon which they are granted may be divided into three classes:—

1st. Degrees are granted without residence and to all comers, irrespective of nationality, who have completed the medical curriculum in an approved school or schools—the University of London.

2nd. Degrees are granted with extra-mural residence during the whole or part of the five years' curriculum—the Scotch Universities, Durham and Victoria Universities, and the Royal Irish University.

3rd. Degrees are granted after intra-mural residence, with or without graduation in arts—the Universities of Cambridge, Dublin, and Oxford.

WITHOUT RESIDENCE.

The University of London is one of the most liberal bodies in the world. Without distinction of sex, race, or creed this University throws its doors open to the talented of the human family. In medicine only is there any restriction, and that to the extent which the Medical Council has imposed in the five years' curriculum. The first step in respect to all its degrees is to pass the

Matriculation examination. To this there is no exception, no other examination whatever being accepted in lieu of it. The examination is in the following subjects:—

1. Latin; 2. *One* of the following languages:—Greek, French, German, Sanskrit, Arabic; 3. The English language; and English history, with the geography relating thereto; 4. Mathematics; 5. Mechanics; 6. *One* of the following branches of science:—Chemistry, heat and light, magnetism and electricity, botany.

Candidates must be at least 16 years of age, and they may enter for a pass or for honours. The examination is held twice a year, on the second Monday of January and the second Monday of June. In 1896 the January examination will be held in the following towns, viz.:—*Birmingham*—The Mason Science College; *Bristol*—The Merchant Venturers' Technical College; *Cardiff*—Dumfries College (for University College); *Glasgow*—The Training College, New City Road; *Leeds*—The Yorkshire College; *Newcastle-on-Tyne*—Rutherford College; *Plymouth*—The Public School; *Portsmouth*—The Grammar School. In June the examination will be held at:—*Aberystwith*—University College; *Bangor*—University College; *Birmingham*—The Mason Science College; *Bristol*—University College; *Cardiff*—University College; *Edinburgh*—The Heriot-Watt College; *Leeds*—The Yorkshire College; *Liverpool*—University College; *Manchester*—The Owens College; *Newcastle-on-Tyne*—Rutherford College; *Nottingham*—University College; *Plymouth*—The Public School; *Sheffield*—Firth College. The examination is also held in London. The fee is 2*l*., and it must be paid to the Registrar, London University, Burlington Gardens, London, W., not less than five weeks before the commencement of the examination, and as a form has to be obtained from the Registrar, application should be made before then. The examination is in writing, and the questions are published in the *University Calendar*. Solutions are published regularly in the *University Correspondent* (monthly, from S. W. Heaton, 13 Booksellers' Row, Strand, London; price 2*d*.). The first candidate in honours gets an exhibition of 30*l*., the second 20*l*., the third 15*l*., each for two years; and various other honours are attached to the examination, the nature of which may be seen in the *Calendar*. We may add that the whole of the subjects of the examination must be passed at one time, and failure in one means failure in all. The next step in the M.B. degree is for the student to pass the *Preliminary Scientific* examination. This is open to him as soon as he passes the Matriculation, but it is not practicable to take it within six months of the Matriculation, as the notice, &c., required excludes the student. The subjects of the examination are (a) chemistry and physics and (b) general biology, which may be taken one at a time or together. In 1896 the examination will be held on January 20, at various centres; the examination will also be held on July 20 in London and provincial centres, but it is necessary to attend at London for the practical physics and biology. The fee is 5*l*., and must be paid between four and six weeks beforehand. As the examination is one which those who have passed the Minor or Major should with a little further study be able to pass, we may state that it comprises a written paper in inorganic chemistry, with a practical and *visà-voce* examination in qualitative analysis; the experimental physics includes a paper on acoustics, heat, magnetism, electricity, and optics, with a *visà-voce* examination on the use of instruments; the biology paper is supplemented by a six-hours' practical examination in microscopy and the dissection of animals and plants. For honours the examination is much stiffer, but candidates should refer to the *Calendar* in regard to it. The best candidates in each of the three subjects—viz., chemistry, botany, and zoology—receive exhibitions of 40*l*. each for two years. Not less than two years after passing the Preliminary Scientific, and three after passing the Matriculation, the interval having been passed in studying the prescribed subjects at a British or colonial medical school (one year being in the United Kingdom), the candidate may enter for the *Intermediate Examination in Medicine* if he or she is nineteen. The subjects of the examination are, for a pass:—(a) Printed papers on anatomy, physiology and histology, organic chemistry, materia medica, and pharmaceutical chemistry; (b) *Visà-voce* interrogation and practical examinations on anatomy, physiology (chemical physiology includes the proximate principles of

the food and of the body, proteids, fats, carbohydrates, milk, flour, bread, meat, the blood, the action of digestive juices, bile, urine; the quantitative estimation of sugar, albumen, urea, phosphates, and chlorides; the use of the spectroscopic, organic chemistry, materia medica, and pharmaceutical chemistry. This examination is held only in London, and the fee for it is 5*l*. The Final or M.B. examination cannot be taken within twenty-one months of passing the Intermediate. The fee is the same, and the subjects are general pathology, general therapeutics, hygiene, surgery, medicine, obstetric medicine, forensic medicine. The examinations include questions in surgical and medical anatomy, pathological anatomy, and pathological chemistry. Honours are given in each of these strictly professional examinations, and the best men get valuable awards. The degree of B.S. is also granted by the University, and at stated periods after graduation the doctorates may be proceeded to. The doctorate degree is granted on the presentation of a thesis incorporating original observation.

It may be useful for London students, who take the double qualification, to know that the University of Brussels confers the degree of M.D. upon registered medical practitioners. The degree is not registrable; but it is considered good enough for many respectable London practitioners to take. The examination is conducted in Brussels by means of interpreters. The cost of the examinations and diploma is 22*l*. All applications concerning the degree to Dr. Albert Mills, 30 Rue du Pépin, Brussels. Information can also be obtained from Dr. Walter Reeves, 44 Ebury Street, London, S.W.

WITH EXTRA-MURAL RESIDENCE.

Scotch Degrees.

The Scotch University Commissioners have brought the four Universities to a level, so a description of the requirements of one will serve as a guide to the whole. First, in respect to the Preliminary examination, the subjects are as follows:—(1) English; (2) Latin or Greek; (3) Mathematics; (4) one of the following:—Latin or Greek (if not already taken), French, German, Italian, dynamics. A definite course of study is prescribed each year thereafter, for particulars of which we refer the inquirer to the regulations of the respective Universities. The only exemptions whatsoever to the Preliminary examination are:—A Degree in Arts or in Science of the Universities of the United Kingdom; the Leaving Certificates of the Scotch Education Department in Latin, Greek, and Mathematics; the Higher and Honours Grade Leaving Certificate in English and Modern Languages; and the Higher Certificate of the Oxford and Cambridge Schools Examinations Board. Also the following University certificates: *Oxford*—Responsions, Moderations; *Cambridge*—Previous Examination; *Oxford and Cambridge Schools Examinations*. *London*—Matriculation Examination; *Dublin, Trinity College*—Public Entrance Examination; *Royal University of Ireland*—Matriculation Examination; *Victoria University*—The Preliminary Examination, the Entrance Examination in Arts, and certain foreign and colonial certificates.

The points about the Scotch Universities' medical curriculum to be noted are:—(1) Five years' medical study, of which at least two must be at the University whose degree is sought; (2) three years' clinical instruction in hospital; (3) the whole of the Medical Council's subjects must be taken, and in addition botany the first year; (4) courses on mental diseases and diseases of children are necessary, but only twelve labours have to be attended. One of the regulations is peculiar to the Scotch Universities, and has brought the Commissioners into conflict with the Medical Council. It is—

If any candidate, before presenting himself for his Preliminary examination, has attended in any University of the United Kingdom, or in any University or institution specially approved, or under any teacher specially recognised for the purpose by the University Court, a course or courses of instruction in physics, chemistry, botany, or zoology, equivalent in the judgment of the Senatus to the qualifying course in the same subject in the University of Edinburgh, such attendance will be held as entitling him to be examined in these subjects; and if the candidate has attended such course or courses in each of the said subjects, he will be held to have completed his first year of medical study. If a candidate have obtained a degree in science or in arts in any University other than a University of the United Kingdom, granted in either case after a course of study and an

examination in botany, zoology, physics, or chemistry, it shall be in the power of the University Court to exempt such candidate from the examinations in such subject or subjects.

This means that the medical curriculum can be cut down to four years. There are four professional examinations:—*First*, on botany, zoology, physics, and chemistry; *second*, on anatomy, physiology, materia medica and therapeutics; *third*, in pathology and medical jurisprudence and public health; *fourth*, in surgery and clinical surgery, practice of medicine and clinical medicine, and midwifery.

The first examination may be taken two subjects at a time at the end of the first year; the second comes on at the end of the third winter session; but materia medica and therapeutics may be postponed until the end of the summer session following. The third examination may be taken at the end of the fourth winter session, medical jurisprudence and public health being postponed, if desired, until the summer following; and the fourth examination is taken at the end of the five years' curriculum. The examination-fees amount to 23*l*. 2*s*. The degrees of the Scotch Universities are now open to women, as also are the various classes in medical subjects. The Universities of Aberdeen, Edinburgh, and Glasgow have the complete curriculum for the degrees, but the medical faculty at the St. Andrews University is not complete, and there has been little, if any, medical teaching there for generations. The degree granted is M.B., C.M. (Bachelor of Medicine and Master of Chirurgery), which carries with it the courtesy title "Dr." The full M.D. is obtainable on presentation of a thesis after three years, and those who wish to proceed this length must pass in logic and Greek at the Preliminary examination.

The affiliated University Colleges of Leeds and Liverpool, and the Owens College, Manchester, have medical schools, the curricula of which qualify for the degrees of the Victoria University, which is an incorporation of the three colleges for the purpose of granting degrees and diplomas. Those who commence medical study in either of the schools must pass an entrance examination in arts, or hold one or other of the following:—An arts degree, Cambridge Previous examination, Oxford Responsions, Victoria University Preliminary examination, London Matric., Oxford and Cambridge Senior leaving certificate, or Junior Local with honours, and Senior Local, College of Preceptors first-class certificates. The Entrance examination is held in June and September each year at all the Colleges, the subjects being the same as prescribed by the General Medical Council. The special books for next year are:—

Greek—Xenophon, "Anabasis," Book VII.

Latin—Cicero, "In Catilinam," Book III., IV.; Ovid, "Heroides," Books I., II., III., V., VII., XII.

French—Xavier Marmier, "Le Protégé de Marie-Antoinette."

German—Hauff, "Die Sage von Hirschgülden."

The fee for the examination is 2*l*. Application for admission to it may be made to the Secretaries of the respective Colleges (see page 393.) The conditions as to residence at one or more of the colleges are the same as at the Scotch Universities—viz., two of the five years of the curriculum must be spent at the colleges, and the rest at a recognised medical school, and one of the two must be after passing the first M.B. examination. There are three professional examinations, practically of the same nature as those of the London University, and the fees are the same also. The degree is a good one and gains in value every year.

The University of Durham has a college of medicine at Newcastle-on-Tyne; but the Preliminary examination is held at Durham, the Medical examinations at Newcastle, and the degrees are conferred at Durham. One year's study only in Newcastle is necessary, so that those who are resident in London find the Durham degree the most easily obtainable; but we call the attention of such persons to the Entrance examinations, which are quite peculiar, and to which the only exemption is in favour of those who hold a degree in arts. The Registration examination must first be passed. The subjects include all those required by the Medical Council, and after passing these, and been registered as a medical student, the candidate must pass an examination in any four of the following subjects, viz.:—

Greek.—Xenophon, "Anabasis," Book II. Latin.—Cicero, "De Senectute." French.—Souvestre's "Le Philosophe sous les toits," German.—Hauff's "Das Wirthshaus im Spessart." Mechanics, Hydrostatics, and Pneumatics. Euclid.—Books IV. and VI. English History.—James I.—James II. Geometrical Optics. Logic.

The fee for each examination is 1*l*. They will be held in 1896 on March 17 and on September 22. Application should be addressed to Mr. A. Beanland, the University, Durham. There are four professional examinations in the course of the five years' curriculum, but graduates in arts or science of any University recognised by the Medical Council who shall have spent a year in the study of physics, chemistry, and biology, and have passed an examination in these subjects for the degrees in question, are held to have completed the first of the five years of medical study, but they must pass the examination. The M.D. may be taken on thesis three years after graduation, and the University grants this degree also to those who have been in practice fifteen years and are forty years old. The conditions in regard to this may be seen in the *University Calendar*.

M.B.R.U.I. The Royal University of Ireland (Dublin) grants its medical degrees on the following conditions. The student must pass the Matriculation examination held in Dublin and various provincial towns in June and September, the subjects being Latin, Greek, or a foreign language, English, mathematics, and natural philosophy. After passing that the student takes a year at arts and passes the First examination in the same subjects as the Matriculation, but higher. It is considered advisable by Irish teachers for students to pass the Matriculation in the same year that they pass the Middle Grade Intermediate, so as to avoid doing the former on commencing medical studies. Then they may take the First University and First Medical courses together in the same year; pass the First University in June, and the first Medical in the following October. There are four professional examinations at the end of the first, second, third, and fifth years. For further information write to the Secretaries, Royal University, Earlsfort Terrace, Dublin, for copies of the "Arts Pamphlet" (5*d*. by post) and the "Medical Pamphlet" (3*d*. by post). They contain a detailed account of the various courses, Arts and Medical, as well as the programmes of all examinations.

WITH INTRA-MURAL RESIDENCE.

We now come to the consideration of those degrees for which residence at a college of the University is requisite. This means that such degrees are available for the well-to-do, or those who, through brain power, secure scholarships, or other aids in their education. The conditions of residence are stringent. Thus, to obtain the Oxford degree,

the candidate must first take the B.A. degree, which involves three years' residence, and a certain number of terms which must be passed in the college to which the student is attached, or if he has had a licence from the authorities to live in lodgings in Oxford he must sleep in the lodgings six weeks out of the eight that an ordinary term lasts. In respect to shorter or longer terms a proportionate number of nights must be slept in the college, or licensed lodgings. At college the time at which a man comes in is noted, and it is the duty of the licensed lodging-house-keeper to report to the University authorities how often the student does not sleep there during the term. The six weeks need not be consecutive. There are three examinations for the B.A., and after obtaining it the candidate must reside at the University for at least nine terms, the terms being so regulated that he may, with little difficulty, attend the more extensive hospital practice in London during the four years required to complete the curriculum if he has taken his B.A. on the science side.

The conditions obtaining in Cambridge University are much similar to those of Oxford, but here is the important difference—that the student is not required to pass the B.A. examinations, the "Previous" examination, or some other examination accepted by the University as conferring exemption from the Previous examination. The subjects of this examination include Greek and Latin, Euclid, arithmetic, and algebra, with the usual examination in English, including history and literature, as prescribed for the year. Thereafter, the student must reside in the University for nine terms (there are four terms in a year), so

that he has excellent opportunity of taking advantage of the London schools, and the peculiar circumstances which residence at Cambridge afford. Many London medical students follow this course, and several of the metropolitan schools have special arrangements for them. There is the distinct advantage of no arts course to be considered in regard to Cambridge, and the fact that the period of residence is the same as at the Scotch Universities. The cost is, of course, greater, although the examination fees are low. There are three examinations, after passing which the student must "keep an act"—i.e., write a thesis on a subject approved by the professor, and be examined and cross-examined thereon. The M.D. can only be taken five years later on stringent terms. M.A.'s have the privilege of going forward to the M.D., taking all the M.B. examinations, &c., at once.

The conditions upon which the University of Dublin.

Dublin grants the degree of Bachelor of Medicine are substantially the same as obtain at Oxford—that is, the candidate must first pass the examinations for B.A. before he commences, or before the Final medical examination, in the latter case passing sufficient of it to enable him to register as a medical student before beginning.

PUBLIC-HEALTH DIPLOMAS.

Those who have had training in pharmacy or special knowledge of chemistry may, after graduation, proceed further with their studies and take a degree or diploma, which will enable them to hold a public appointment as a medical officer of health. This means that the student must pass an examination in analytical chemistry, including the analysis of air, water, &c., the laws relating to public health, the principles of sanitation, &c. As this acquirement does not alter the conditions preliminary to entering upon study, the student will find out for himself during his curriculum whether he will go forward to such qualification or no, and what the conditions are.

MEDICAL SCHOOLS.

We group here the concisest possible particulars regarding the medical schools and Universities throughout the kingdom where the medical curriculum may be taken in whole or part. Study at one and all of these places is recognised by the colleges which grant diplomas, while part of the curriculum for certain of the medical degrees may be taken at most of the university colleges. For particulars under the latter heading we recommend students to consult the *University Calendars*. The winter courses commence in all the schools on or about October 1; the summer courses in the beginning of May.

The subjoined paragraphs give in one sum the total cost of lectures, practical classes, and hospital practice required by the examining bodies; in the case of the London schools for the double qualification, and in the Universities for the degrees granted thereat. Any exception to this statement is noted, and we also remind students that they must allow for cost of anatomical subjects, instruments, apparatus, books, and certain incidental class expenses, which add from 25 to 50 per cent. to the sums stated. Many of these schools advertise in this issue, and in their advertisements fuller particulars will be found.

LONDON.

CHARING CROSS HOSPITAL, 62 Chandos Street, W.C.—Fees, 115*l*. 10*s*., or 127*l*. 1*s*. in instalments. Dean, Mr. Stanley Boyd.

GUY'S HOSPITAL, Borough, S.E.—Fees, 157*l*. 10*s*., or 168*l*. in instalments. Has a residential college, in which rooms cost from 9*s*. to 27*s*. per week, without board. Dean, Dr. Shaw.

KING'S COLLEGE, Strand, W.C.—Fees, 148*l*., or 164*l*. in instalments for M.B. Lond. Has a residence; terms, 50*l*. to 60*l*., inclusive, per academical year. Dean, Professor Curnow, M.D.

LONDON HOSPITAL, Mile End, E.—Fees, 126*l*., or 136*l*. 10*s*. in instalments. Warden, Mr. Munro Scott.

LONDON SCHOOL OF MEDICINE FOR WOMEN, 30 Handel Street, Brunswick Square, W.C.—Fees, 125*l*., or 135*l*. in instalments. Secretary, Miss Heaton.

MIDDLESEX HOSPITAL, Cleveland Street, W.—Fees, 126*l.* or 136*l.* 10*s.* in instalments. Secretary, Dr. W. Pasteur. Residential College, 14*s.* 6*d.* to 17*s.* 6*d.* per week. Warden, the Rev. W. G. Deighton.

ST. BARTHOLOMEW'S HOSPITAL, West Smithfield, E.C.—Fees, 157*l.* 10*s.*, or 168*l.* in instalments. Has a residence for students. Warden, Dr. T. W. Shore.

ST. GEORGE'S HOSPITAL, Hyde Park Corner, S.W.—Fees, 145*l.*, or 150*l.* in instalments. Dean, Dr. Isambard Owen.

ST. MARY'S HOSPITAL, Cambridge Place, Paddington, W.—Fees, 133*l.*, or 143*l.* in instalments. Dean, Mr. Geo. P. Field. Has a residential college; charge, 75*l.*, inclusive, per academic year. Warden, Mr. E. W. Roughton.

ST. THOMAS'S HOSPITAL, Albert Embankment, S.E.—Fees, 150*l.*, or 157*l.* 10*s.* in instalments. Medical Secretary, Mr. G. Rendle, at the Hospital.

UNIVERSITY COLLEGE, Gower Street, W.C.—Fees, 141*l.* 15*s.*, or 147*l.* in instalments. For all examinations for M.B. Lond., 169*l.* 6*s.* Dean, Professor A. E. Barker.

WESTMINSTER HOSPITAL, Caxton Street, S.W.—Fees, 115*l.*, or 132*l.* in instalments. Dean, Mr. Spencer.

PROVINCES.

ABERDEEN.—*University*.—Fees are about 90*l.* Secretary Mr. D. R. Thom, M.A.

BELFAST.—*Queen's College*.—Class lectures, from 2*l.* to 3*l.* per course in each subject. Registrar, Dr. Purser.

BIRMINGHAM.—*Queen's Faculty of Medicine, Mason College*.—Fees, 112*l.* Secretary, Mr. Geo. H. Morley.

BRISTOL.—*University College Medical School*.—Fees, 95*l.* or 105*l.* Dean, Dr. E. M. Skerritt.

CARDIFF.—*University College*.—Fees for the first three years of the curriculum, 47*l.* 10*s.* Registrar, Mr. J. A. Jenkins, B.A.

CORK.—*Queen's College*.—Fees, 78*l.* 1*s.* Registrar, Mr. Alexander Jack, M.A.

DUBLIN.—*Catholic University Medical School, Cecilia Street*.—Fees, from 141*l.* 15*s.* for double L. A. H. to 163*l.* for Royal University degree (inclusive of examination fees). Registrar, Dr. A. Birmingham.

University School of Physic (Trinity College).—Fees, 125*l.* 9*s.* (degree fees, 27*l.*). Registrar, Mr. H. W. Macintosh, M.A., Trinity College.

DUNDEE.—*University College*.—The first two years of the curriculum may be taken here. Secretary, Mr. R. N. Kerr.

EDINBURGH.—*School of Medicine*.—Fees about 100*l.* Secretary, Dr. S. Macadam, Surgeons' Hall, Nicolson Street.

University Medical School.—Fees, about 120*l.* (including hospital and fifth year, but excluding certain practical classes). Secretary to the Senatus, Mr. John Kirkpatrick.

School of Medicine for Women, Surgeon Square.—Fees, 122*l.* for M.B. Ed. or triple qual. Secretary, Miss Black.

GLASGOW.—*University Faculty of Medicine*.—Fees as at Edinburgh. Assistant-Clerk, Mr. W. Innes Addison, Matriculation Office.

Anderson's College Medical School, Dumbarton Road, Partick.—Total fees, less than 50*l.* Secretary, Professor A. M. Buchanan.

Queen Margaret College.—This is the women's department of the Glasgow University, and there are classes for graduation in arts and medicine in it distinct from the men's classes. We understand that last year sixty women commenced to study medicine at the college. The cost of the five years' curriculum for M.B., C.M., is 104*l.* Secretary, Miss Galloway. There is a residence.

St. Mungo's College and Glasgow Royal Infirmary.—Fees for triple qual., 68*l.* Dean, Professor Kent, 86 Castle Street.

LEEDS.—*Yorkshire College*.—Fees (exclusive of first M.B. instruction), 105*l.* Dean, Mr. Thomas Scattergood, 41 Park Square.

LIVERPOOL.—*University College*.—Fees as at Owens College. Dean, Professor Gotch.

MANCHESTER.—*Owens College*.—Fees for M.B., 138*l.* 5*s.* Registrar, Mr. H. W. Holder, M.A.

NEWCASTLE-ON-TYNE.—*Durham College of Medicine*.—Fees, 106*l.* 1*s.* Secretary, Lieutenant H. Fox.

SHEFFIELD.—*School of Medicine*.—Composite fees are not quoted. Class fees are 2*l.* 2*s.* to 4*l.* 4*s.* Hospital practice, 45*l.* Hon. Secretary, Dr. W. T. Cocking, Leopold Street.

DENTISTRY.

THE conditions as to preliminary education and examination for those entering the dental profession are precisely the same as those for medical students. If anyone now in pharmacy who has some knowledge of practical dentistry wishes to proceed further and obtain a dental diploma, entitling him to registration as a dental practitioner, he must first do all that is directed on page 388 for those wishing to be registered as medical students. It is important to recognise that service with a chemist and druggist who is a registered dentist stands good as part of the four years' practical training required by the General Medical Council, who have the sole control of dental as well as medical matters. The Council have made this rule, as regards the four years' service counting as soon as the student is registered, during the past year only.

The qualifying bodies require the student to attend general and dental hospitals during two winter and two summer sessions. The nature of the studies is as follows:—The day begins throughout the curriculum with an hour at the dental hospital, where the student gets instruction in the common dental operations. Other subjects taken during the first winter session are anatomy, physiology, chemistry, dental metallurgy, dental surgery and anatomy, and operative dentistry from the theoretical side. The first summer session is devoted to practical physiology, materia medica, dental metallurgy, mechanics, and histology, with the usual hospital practice; and if chemistry was not taken the previous session it must be taken now, so as to enable the student to get through the first part of the professional examination (Irish or Scotch). Practical pharmacy (not obligatory for those who have three or four years' experience in the trade) and practical chemistry are taken during the first summer. The second winter is devoted to general anatomy, medicine, and surgery, with a continuation of the specialised anatomy and surgery, and lectures in operative dentistry. The last session is devoted solely to dental subjects—viz., mechanics and pathology. Mr. Spokes, Dean of the National Dental Hospital and College, in a recent note gives us a clear statement regarding the dental work which it may be useful to quote. He says that the "student, on entering the hospital, passes through a carefully-graded course under the care of a demonstrator before he undertakes the treatment of patients. After being 'signed-up' for this preliminary work outside the month, he is expected to do, and get 'signed-up' for, 300 fillings (150 of which must be gold), besides crown-work and regulation cases. In addition to this he must take his turn on the extraction-list, first as a junior, and later as a senior, when he operates upon patients who are under nitrous-oxide gas. Besides the instruction received during two years from all the members of the staff, he has the advantage of special coaching by the tutors before going in for his Final examination for the dental diploma."

The collegiate and hospital studies may be taken, and are reckoned when taken, concurrently with pupilage; indeed, it is customary to begin them in the third or fourth year of apprenticeship. In that case, however, it is impossible to get through the whole of the work in two years, four being nearer the thing. We recommend the student to give up two years wholly to the work, commencing the hospital dental work two years earlier. The candidate is not admitted to the examination finally until he is 21.

ENGLISH L.D.S.

Communications in regard to the examinations for this diploma should be addressed to Mr. Halkett, Examination Hall, Victoria Embankment, London. The fee for the examination is 10 guineas. The examination is partly written, partly practical, and partly oral. The written

examination comprises general anatomy and physiology, general pathology and surgery, dental anatomy and physiology, and dental pathology and surgery. At the practical examination candidates may be examined—

- (a) On the treatment of dental caries, and may be required to prepare and fill cavities with gold or plastic filling or material, or to do any other operation in dental surgery. (Candidates must provide their own instruments.)
- (b) On the mechanical and surgical treatment of the various irregularities of children's teeth.
- (c) On mechanical dentistry.

The oral examination comprises the several subjects included in the curriculum of professional education, and is conducted by the use of preparations, casts, drawings, &c.

SCOTCH L.D.S.

This diploma is granted by the Scotch Royal Colleges and the Glasgow Faculty, to the secretaries of which all letters regarding it should be directed. See page 390. There are two examinations, and women are admitted to them. The first examination is in chemistry, anatomy, and physiology, and is taken at the end of the first year, as already indicated; then all the rest of the subjects named above are covered at the second examination at the end of the curriculum. The fee is 10*l.* 10*s.*

IRISH L.D.S.

The Royal College of Surgeons, in Ireland, is the examining body here. The examinations are like the Scotch, but the fee is 26*l.* 5*s.* The College admits to the final part of the examination, without collegiate study, anyone on the dentists' register; but it is as well for any chemists who think of adding L.D.S. to their names in this way to know that the College requires its licentiates to sign a declaration that they will not advertise. A special declaration has to be made in applying for admission to the examination *sine curriculum*, and this may be obtained from the Secretary, with all particulars as to the date of the examination, &c.

AMERICAN D.D.S.

The degrees in dental surgery granted by numerous U.S.A. Universities are not registrable in this country, and any unregistered dentist using a degree of that kind in such a way as to lead people to suppose that he is so registered, may be fined under the Dentists Act. But the D.D.S. may be used by registered persons. The degree may be obtained in New York, Baltimore, Philadelphia, Chicago, and other cities in the United States, about a year's residence being requisite. We may take the conditions at the University of Maryland, Baltimore, as typical. Here it is required that the candidate should attend two full courses of lectures of five months in different years (winter sessions) in the University. The following, however, is considered equivalent to an attendance on one course of lectures:—One course in any reputable dental college; graduation in a reputable medical college, with one year of dental pupilage in a dental infirmary. The student meeting either of these requirements may present himself as a candidate for graduation at the end of one course of lectures. The winter session begins on October 1. Fees, \$100, and dissecting ticket, \$10; matriculation fee, \$5; diploma or graduation fee, \$30. It will be seen from this that an L.D.S. of the United Kingdom can leave here in September and return in March or April following with his D.D.S., or anyone who has studied six months in a dental college on this side may do the same. The experience gained is valuable, for, if American dentistry is not a bit better than English, it is peculiar, and we have been taught a thing or two by the other side.

DENTAL SCHOOLS.

LONDON.

Guy's Hospital, Borough, S.E.—Dean, Dr. Shaw. Fees for complete instruction for L.D.S. Eng., 110*l.*

Dental Hospital, Leicester Square, W.—Dean, Mr. Morton Smale. Fees for dental subjects, 50*l.*

National Dental Hospital and College, 149 Great Portland Street, W.—Dean, Mr. Sydney Spokes. Fees, 63*l.*

The various London Hospitals offer facilities to dental students, and the general subjects may be taken at the medical schools attached to them.

PROVINCIAL.

Birmingham: Mason College Dental Department.—Fees for the complete curriculum, 73*l.* 2*s.* Hon. Sec., Mr. J. Humphreys.

Bristol.—Dental surgical practice with clinical lectures at the Infirmary (fee, 12*l.* 12*s.*), and the other subjects at University College. Fees, 3*l.* 3*s.* to 5*l.* 5*s.* per subject. Secretary—Mr. W. Thwaites.

Dublin: Dental Hospital of Ireland, 25 Lincoln Place.—Dean, Dr. R. T. Stack. Fees for all subjects, 73*l.* 10*s.*

Edinburgh: Dental Hospital and School, 5 Lauriston Lane.—Dean, Mr. Bowman Macleod, 16 George Square. Fees for all subjects, 78*l.* 13*s.*

Exeter: Dental Hospital, Castle Street.—For dental practice only. Hon. Sec., Mr. Henry Yeo.

Glasgow: Dental Hospital and School, 4 Chatham Place, Stirling Road.—Secretary, Mr. D. M. Alexander; 117 Wellington Street. Fees for dental subjects, 23*l.* 2*s.*

Glasgow: Royal Infirmary.—Instruction may be obtained here and at Anderson's College Medical School.

Liverpool: University College School of Dental Surgery.—Fees for all subjects, 73*l.* 2*s.* Particulars from Professor H. M. Paterson, M.D.

Manchester: Owens College Dental Department.—Dean, Mr. G. G. Campion. Fees for all subjects, 73*l.* 2*s.*

Newcastle-on-Tyne: College of Medicine.—Fees for medical subjects and dental and general hospital practice, 48*l.* 6*s.* Secretary, Lieut. H. Fox.

Plymouth: Dental Hospital, Octagon.—Fees for dental subjects, 23*l.* 2*s.*

Sheffield: Firth College.—No special arrangements for dental students, but certain subjects can be taken at the School of Medicine.

VETERINARY SURGERY.

THE conditions of entry into the veterinary profession are practically the same as for medicine, as the Royal College of Veterinary Surgeons requires all who enter for the first professional examination to show that they have passed one of the examinations in general education recognised by the Medical Council. Of course it would be foolish for the student to begin his professional studies before passing that examination. The information given under the Medicine section, therefore, applies to veterinary students.

The veterinary curriculum consists of four sessions' study at a college recognised by the Royal College before mentioned. There is a professional examination at the end of each college-year, conducted by the examining-board of the Royal College of Veterinary Surgeons, sitting in London and visiting Edinburgh and Glasgow. The "sessions" referred to must be at least thirty weeks each. This means residence of just two and a half years at college, but it should be noted that the Royal College of Veterinary Surgeons requires study "at one or more veterinary schools for a period of not less than four years." This implies that the student shall be at the college in each of the four years, as otherwise it is impossible for him to get the necessary certificates. The subjects of the professional examinations, which are written and oral, are as follows:—

First. Examination A.—1. Anatomy of domesticated animals: bones, ligaments, and joints. 2. Chemistry and elementary physics. 3. Biology: elementary zoology and botany.

Second. Examination B.—1. Anatomy of domesticated animals. 2. Histology and physiology. 3. (oral only) Stable management and manipulation of domesticated animals; principles of shoeing.

Third. Examination C.—1. Morbid anatomy, pathology, and bacteriology. 2. Materia medica, pharmacy, therapeutics, and toxicology. 3. Veterinary hygiene and dietetics.

Fourth. Examination D.—1. Principles and practice of veterinary medicine and surgery; clinical medicine, surgery, and obstetrics (horse). 2. Principles and practice of veterinary medicine and surgery; clinical medicine, surgery, and obstetrics (other domesticated animals); meat inspection.

Before admission to any examination the candidate must produce a certificate from his college principal that he has studied the subjects, and before admission to the Final he must be 21 years old. The examinations are held three times a year—in March, April, or May, in December or January, and in July. The total fees are 20*l.*, payable a fourth at a time, and a registration fee of 1*l.* on passing the Final. All letters in regard to the examinations should be addressed to the Secretary, R.C.V.S., Red Lion Square, London, W.C.

VETERINARY SCHOOLS.

Royal Veterinary College, Camden Town, London, N.—Fees, 84*l.* Dean, Professor McFadyean.

Royal (Dick) Veterinary College, Clyde Street, Edinburgh.—Fees, 57*l.* 15*s.* Secretary, Professor A. E. Mettam.

The New Veterinary College, Leith Walk, Edinburgh.—Fees, 57*l.* 15*s.* Principal, Professor W. Williams.

Glasgow Veterinary College, Buccleuch Street, Garnethill.—Fees, 63*l.* Secretary, Mr. R. Dobbie.

Further information regarding the courses of study is given in the prospectuses of the various colleges, which intending students are advised to get from the persons named above. The winter sessions begin the first week in October, and the summer sessions the first week in May. Students are advised to begin the curriculum in winter. A useful "Guide to the Veterinary Profession" is published by Mr. James Thin, Edinburgh, price 1*s.*, post free 1*s.* 1*d.* It contains the professional examination questions.

ARMY VETERINARY DEPARTMENT.

Persons possessing the M.R.C.V.S. diploma may compete for appointments on the Veterinary Department of the Army. Pay begins at the rate of 250*l.*, and increases to 365*l.* a year at ten years' service, the maximum being 850*l.*, paid to the principal veterinary surgeon. The appointments are for ten years (increased, however, in exceptional cases), at the end of which period the retiring surgeon receives a gratuity of 800*l.* Applications for admission to the Veterinary Department of the Army should be addressed to the Principal Veterinary Surgeon, War Office, Pall Mall, London, and be accompanied by a certificate of age, and testimonials of character and qualifications.

SCIENCE.

It is considered by some people in the higher ranks of chemistry the correct thing to belittle what this country does in teaching science. Our technical arrangements are far inferior to those of Germany, say those who know both countries well enough to be able to judge, and they have said it so long that we have almost begun to believe them. A better feeling is setting in at last, and authorities are beginning to see that technical education is not neglected. We may have a larger proportion of voluntary schools than Germany, and a less proportion of State-endowed schools, but we have facilities enough for all who wish to study science for its own sake or as a means of making a living.

In these annual articles we have been accustomed to deal only with the chemical and physical branches of science, but it happens that there is up to a certain point in scientific teaching a similarity of work. The young engineer must know something of chemistry, and the future technical chemist must have more than a general knowledge of mechanics; so for a time these men sit on the same benches. Analytical chemistry needs a special training, such as that required by the Institute of Chemistry, where the object is to prepare the student by giving him a thorough grounding in the science and other branches of knowledge allied to it, whereby, without little additional training, he can adapt himself to any kind of work that he may be called upon to perform. The University colleges of

the country train for this qualification, while they also make it a point to train students in the scientific branches of the leading industries of the localities. This is a course which is often the most advantageous to follow—viz., to prepare for the A.I.C., simultaneously working for any special post which may be open in the neighbourhood. It is beyond us to indicate all the branches of technical chemistry there are, and the special knowledge required in each. All that we can do is to give particulars of the leading courses of instruction, and degrees or qualifications obtainable in this country. So far as chemistry is concerned, there is nothing which we are oftener asked about than the

GOVERNMENT ANALYTICAL APPOINTMENTS

in the Somerset House and Customs laboratories, which are worth from 80*l.* to 800*l.* a year, according to position. The first step to these appointments is to join the Civil Service, about which the anxious will find all particulars in the "Civil Service Guide," published yearly at 1*s.* 6*d.*, and to be obtained from booksellers to order. The Excise branch of the service must be joined, and that cannot be done until the age of eighteen. If the candidate is fortunate in getting an appointment he may in due course apply to the directors of his department for permission to compete for any vacancies in the laboratory staff which may arise, and, that granted, he is required to pass an examination in chemistry and other subjects. This done he is called to London, where he attends the Royal College of Science for two years, getting a thorough grounding in chemistry, physics, &c., and is at Somerset House initiated into the peculiar work which goes on there. The Government has chemical stations at Bristol, Leeds, Liverpool, Newhaven, and Southampton in England; at Glasgow and Edinburgh in Scotland; and at Belfast, Cork, and Dublin in Ireland, where the officers are either expert chemists or have had a period of training in London—indeed, the London positions are frequently filled from the provincial chemical stations. The work of Government chemists consists largely in the examination of beer, naphtha, alcohol, tobacco, coffee and chicory, and various alcoholic liquors; but there is in addition a very large amount of miscellaneous work done for various Government departments, and under the Adulteration Act of 1895 one or two hundred specimens referred to the laboratories by the magistrates are examined. We may appropriately mention here the course of training at the

ROYAL COLLEGES OF SCIENCE.

These are situated in London and Dublin, and supported directly by the State. The London college is not exactly open to the public, for it is occupied chiefly by the royal and exhibition scholars. The college was formerly called the Royal School of Mines, and is situated at South Kensington. The staff consists of professors of mining, chemistry, physics, geology, metallurgy, astronomy, and agriculture. Dr. William Augustus Tilden, a pharmaceutical chemist and ex-Bell scholar, is the professor of chemistry, which fact may inspire others to high flights. The full curriculum of the college extends to three years, that being the minimum period for the associateship of the college, which is granted in eight departments—viz., (1) mechanics, (2) physics, (3) chemistry, (4) biology, (5) geology, (6) agriculture, and—associateship of the Royal School of Mines—(7) metallurgy, (8) mining.

Taking the chemistry course as an example, we note that the first year's study comprises chemistry, physics, and astronomical physics, the whole day being devoted to them. In the second year the student takes mechanics and machine drawing and elementary geology and mineralogy, the third year being wholly devoted to chemistry. This is a mere outline of the course, for it will be understood that the subjects are gone into in all their aspects.

The Somerset House students devote two years to chemistry and physics in all their branches. Occasional students are admitted if there is room. Fees:—Chemistry lectures, 3*l.* per term (laboratories, 12*l.* per term); physics lectures, 5*l.* per term (laboratories, 12*l.*); and so on throughout the school. The following are the scholarships annually offered to science students who have entered classes recognised by the department and attended the examinations held in May:—

Royal Exhibitions (four in London and three in Dublin), value 50*l.* a year and free education.

National Scholarships (twenty-two, open each year, tenable in London or Dublin), value 30*s.* a week for forty weeks, third-class return fare to the students' home, and free education.

Free Studentships (six in London), which entitle the holder to free education for three years.

All these scholarships are tenable for three years. They are awarded to the candidates who take the highest marks in mathematics and theoretical and practical chemistry; but half of the National scholarships are awarded as follows:—

Five each year to the candidates who obtain the highest aggregate marks in physics and chemistry (six subjects altogether); four to the candidates who obtain the highest aggregate in mechanics (five subjects); and two to the candidates who obtain the highest aggregate in human physiology, general biology, zoology, and botany, provided that they have obtained, in the current or in some previous year, at least a pass in the elementary stages of one division of theoretical mechanics (subject 6*a* or *b*), of physics (subjects 8 and 9, or alternative physics), chemistry (subject 10), and in 10, or alternative chemistry), and mathematics, stage 1. For further particulars, see "Science Directory," price 6*d.*

A limited number of teachers, and of students in science classes who intend to become science teachers, are admitted free to the sessional courses of instruction in the Royal College of Science. They receive a maintenance allowance of 2*l.*s. per week while under instruction, and third-class railway-fare for one journey to and fro each session between home and the Royal College. In certain special cases the allowance to science teachers in training may be increased to a sum not exceeding 30*s.* Candidates for these studentships in training must send in form No. 400 before June 10, and form No. 1019 before July 1. The forms may be obtained from the Secretary, Department of Science and Art, Whitehall, London, S.W.

The Royal College of Science at Stephen's Green is not so exclusive a school as the London one, and the fees are much lower. Thus, the charge for lectures is 3*l.* each subject per session, and for laboratory practice 12*l.* per session, or 2*l.* per month. Full particulars may be obtained from the secretary, Professor J. P. O'Reilly. Both the colleges require the students to pass an entrance examination in mathematics and geometry, if they have not done so at the May examinations.

CHEMICAL TECHNOLOGY.

The City and Guilds of London Institute have two colleges for the promotion of science as applied to industrial pursuits. At both of these the education afforded is of the highest order, or, rather one is highest and the other is not quite so ambitious. The Technical College at Leonard Street, City Road, E.C., has

day and evening classes, to which persons of either sex are admitted. The departments are:—(1) Mechanical engineering and applied mathematics, (2) electrical engineering and applied physics, (3) industrial and technical chemistry, (4) applied art, (5) the building trades. In the day classes the student may study for one, two, or three years. The total fees are 15*l.* per annum. The evening classes of the college are excellent, and include the study of chemistry in the applied sense. For particulars thereof the college prospectus should be consulted.

This is a high-class college situated in Exhibition Road, S.W. It is intended for those (1) who are training to become technical teachers, (2) to enter engineers' or architects' offices or manufacturing works, or (3) who desire to acquaint themselves with the scientific principles underlying the particular branch of industry in which they are engaged. On entrance the student must pass an examination in elementary, pure, and applied mathematics, mechanical drawing, physics, chemistry, and French or German, and thus become a matriculated student, whereby the annual fees are reduced to 25*l.* Non-matriculated students pay 30*l.* The diploma of A.C.C. is granted to those who complete the curriculum of three years and pass the examinations. In the chemistry

department the subjects of the first year are theoretical and practical chemistry, physics, mathematics, mechanics, and engineering. The second year engineering and chemistry only are taken, but in the latter subject especially there is considerable specialising; and in the third year students spend one day per week during the winter term in either the engineering or physical department, and also attend the crystallography course, the remaining time being spent in pure chemistry. As soon as they have acquired the necessary proficiency as analysts, and sufficient skill in preparing pure substances, they are encouraged to undertake an original investigation.

The training afforded at these colleges specially fits the diplomates for taking positions as managers of works; it is, in fact, an attempt to reproduce the best features of German educational methods into this country. Simultaneously with the study for the diplomas, the student may prepare for the A.I.C. or B.Sc. (Lond.). We now give the necessary particulars regarding these.

A.I.C.

The Institute of Chemistry was founded in 1877 for the purpose of regulating the qualifications of those who make their living as professional chemists. Nearly a dozen years elapsed before the Institute made any headway; but, within the last five years especially the influence upon those entering the calling has been marked and beneficial, and it would be as ridiculous to attempt to take a position in professional chemistry without membership of the Institute as to take a position in medicine without a medical qualification. A science degree is, of course, always respected, but many consider it advisable, if they are to undertake private or public analysis, to supplement the degree with the A.I.C., and in due course the F.I.C. The following are the conditions of entry:—

1st. The studentship of the Institute is granted to any person 17 years of age, or over, who has passed an examination in general education recognised by the General Medical Council, and who is at the time of application a pupil with an F.I.C., or a student at a University or other school of science, for the purpose of becoming an analytical chemist; fee, 5*s.*

2nd. The next stage is the associateship, which is conferred upon persons 21 years of age who have had a systematic course of training of at least three years' duration, or alternately two years with an F.I.C. and two years in chemistry, physics, and mathematics, at a college or University recognised by the Institute; the candidate must, in addition, show that he has had instruction in one of five subjects during his collegiate career, and passed the college class examinations in all the subjects of the curriculum. Thereupon he is admitted to an examination conducted by Institute examiners, and entitled the "Intermediate examination," in theoretical and general chemistry; but if the candidate can show that he has passed certain examinations, such as those for B.A., B.Sc., A.R.C.S., or A.R.S.M., he is exempt from the Intermediate. After that the Final examination in practical work has to be passed, and this is now a stiff examination in analytical and synthetic chemistry. It is conducted in London and at a provincial centre, the fee being 3*l.* 3*s.*, and for the Intermediate, 2*l.* 2*s.* We may state that the examination in practical work occupies four days.

3rd. Having been an associate for three years, the Fellowship of the Institute is open on payment of a fee of 4 guineas.

Most of the University Colleges now adapt their courses to suit the requirements of the Institute. Further particulars in regard to the examinations may be obtained from the Secretary of the Institute, 30 Bloomsbury Square, London, W.C.

F.C.S.

To become a Fellow of the Chemical Society it is necessary to get five Fellows to testify by their signatures that the candidate is a fit and proper person for the honour. After that the applicant has to submit to the ballot, which is no longer carried out in a formal manner, and is generally effectual in keeping out those who by published work or reputation have not distinct ability. Forms of application may be obtained from Mr. Robert R. Steele, Chemical Society, Burlington House, London, W. The fee to be paid on admission is 6*l.*, and thereafter 2*l.* a year.

SCIENCE DEGREES.

London. We propose to treat this subject quite briefly. In the first place, it will be noted that the only degrees obtainable *sine curriculo* are those of the London University. To get these the student must pass the Matriculation examination (see page 390), one year after which the Intermediate examination in science may be taken. This examination, like the Preliminary Scientific, is held in the provinces as well as in London (see page 390), and the subjects are, for a pass—(1) Inorganic chemistry, (2) experimental physics, (3) mathematics, and (4) general biology. Chemistry includes a practical and *vis-à-vis* examination, which is also the case with the physics and biology. The examination may be entered for a pass or for honours, the latter only counting for prizes. The fee is 5*l*. The B.Sc. examination may be taken one year after passing the Intermediate. Candidates must show a competent knowledge of three of the following nine subjects:—Pure mathematics, mixed mathematics, experimental physics, chemistry, botany, zoology, animal physiology, geology and physical geography, and mental and moral science. The examination is held in October in London, the fee for it being 5*l*. Two years after graduating as B.Sc. the candidate may proceed to the doctorate, presenting a thesis in the subject which he professes, whereupon the examiners decide whether a *vis-à-vis* examination is required or not. A man must be very well up before he gets the D.Sc.; indeed, he should make a point of knowing a great deal more about his subject than the examiners do. Otherwise failure is certain.

Victoria. The Victoria University grants a B.Sc. degree on much similar conditions to those obtaining in London so far as examinations and subjects are concerned; but it is necessary to attend one or other of the affiliated colleges for three years. After passing the Preliminary, or Entrance, examination in arts (see page 391) the curriculum begins, and in the course of it the student passes the Intermediate examination, the Final being taken at the end of three years. The higher degree is in this case M.Sc.

Durham Students of the Newcastle-on-Tyne School of Science may obtain A.Sc. or B.Sc. from their alma mater. The Associateship is given on the basis of a two years' course, but the B.Sc. requires three years. All must pass a Preliminary examination, and the A.Sc. examinations are part of the B.Sc. requirements. The branches of knowledge in which the degree is finally granted are mathematics, experimental physics, chemistry, geology and palæontology, mineralogy and petrology, botany, zoology, physiology, and agriculture, as well as engineering.

Scotch. In the Scotch Universities it is necessary to pass a Preliminary examination, practically the same as the Medical Preliminary, the higher standard of mathematics being requisite. The curriculum extends to three years (three winter sessions and two summer sessions, or their equivalent), and of the seven courses of lectures necessary, four must be at the University whose degree is sought. In Edinburgh the degree is granted in—(1) Pure science, (2) engineering, (3) public health (for M.B.'s), and (4) agriculture. In Aberdeen and St. Andrews similar departments exist, except agriculture. Glasgow University also grants the degree, but not in agriculture, and with greater attention to the mechanical branches. The regulations as to the examinations are the same for all the Universities—viz., the First examination is in mathematics, or biology (*i.e.*, zoology and botany), natural philosophy, and chemistry. The second is a year at least after the first, and in three or more of the following subjects:—(1) Mathematics; (2) natural philosophy; (3) astronomy; (4) chemistry; (5) human anatomy, including anthropology; (6) physiology, including histology; (7) geology, including mineralogy; (8) zoology, including comparative anatomy; (9) botany, including vegetable physiology. D.Sc. is granted on the same conditions as in London.

Irish. The B.Sc. of the Royal University of Ireland is open to those who have graduated in any faculty of the University a year previous. It seems a somewhat formal arrangement, and we think the less said about it the better, especially as those who want the degree must spend four or five years in getting through the preliminary proceedings, a somewhat Irish manner of doing it.

Ph.D. Some students of chemistry, after their collegiate career in this country, go to one of the schools in Germany, where they get opportunity for perfecting themselves in the language, and at the same time prepare for the Ph.D. degree, and take advantage of the great facilities for research. The degree is obtainable at about thirty Universities in Germany, Austria, and Switzerland. The highest value is attached to those from Berlin, Stuttgart, Würzburg, and Munich. The other University towns are:—Basle, Berne, Bonn, Breslau, Czernowitz, Dorpat, Erlangen, Freiburg, Geneva, Giessen, Göttingen, Graz, Greiswald, Halle, Heidelberg, Jena, Innsbruck, Kiel, Königsberg, Leipsic, Marburg, Prague, Rostock, Tübingen, Vienna, and Zurich. Most of the Universities require that native students shall have attended one or more of these Universities for seven or eight semesters or half-yearly sessions; but in the case of foreigners this regulation is waived, provided sufficient evidence is adduced of good general and technical scientific education. The London Matriculation examination is accepted as a proof of general education. Recommendations from teachers and professors in England should also be presented. Under favourable circumstances the length of residence required by foreigners is about two years. When proficiency in practical work has been shown, an investigation is either selected by the student, or suggested to him by the professor, in his principal subject, and he must bring it to a definite conclusion, if possible with positive results. For examination, two secondary subjects besides the principal one must be selected, the chemist having to take chemistry and physics and one of the following:—Botany, mineralogy, and geology, or applied chemistry. The student is expected to attend lectures and practical classes in the subjects which he selects. A knowledge of German is, of course, essential. The fees are about 5*l*. per semester for full practical course, and 30*s*. to 2*l*. for daily lectures. Apparatus and materials have generally to be supplied at the student's expense. The fees for examination range from 15*l*. to 30*l*., and part is usually returned when unsuccessful.

A COURSE FOR ANALYSTS.

All the University colleges have special scientific courses leading up to the examination for the diploma of the college, or sufficient to take the student through the subjects of the London B.Sc. It may be useful to mention here a special course which the King's College, London, has just instituted for those desirous of qualifying for the office of public analyst. The course of instruction occupies two years. During the first three months students attend the chemical laboratory under Professor J. M. Thomson, and the remainder of the two years is passed in the State medicine laboratories, where the students go through courses of instruction in the analysis of air, food, water, &c. The fee is 100 guineas. During the second year, anyone meriting such a position is appointed a student demonstrator, and receives from the professor at the close of his course such testimonial as his character and work justify.

AGRICULTURE

is now taught as a science subject in all the University colleges. The courses as a rule extend over two years, and include a considerable amount of chemistry. The Agricultural College at Cirencester, which was founded as the result of Liebig's visit to this country over fifty years ago, has a three years' course, which is recognised as the correct thing. Full particulars regarding these courses can be obtained from the Secretaries of the respective colleges or in the calendars.

SCIENCE SCHOOLS.

We give only the briefest particulars of the colleges and schools of science throughout the country where scientific education may be obtained, as the students must, by personal inquiry at the offices of the schools, obtain what further information they desire. In most of these institutions the subjects of the first medical examination, except anatomy, can be taken, the class-certificates being recognised by examining bodies. The classes in botany, chemistry, and physics are also suitable for pharmaceutical students.

Aberystwith.—*University College of Wales.*—Provides classes in all subjects for B.Sc., &c. Fees, 10*l*. per session,

with small extras for practical science. Registrar, Mr. T. M. Green.

Bangor.—*University College of North Wales.*—Terms same as at Aberystwith. Secretary and Registrar, Mr. J. E. Lloyd.

Belfast.—*School of Applied Chemistry.*—At this school special courses of instruction are conducted to meet the requirements of students preparing for the examinations of the Pharmaceutical Society of Ireland. Full courses commence on September 23, and in the first week of January. Full particulars on application to the Principal, Mr. S. Templeton.

Birmingham.—*Mason College.*—The fees at the science classes are 4l. 4s. per session, exclusive of practical teaching. The subjects taught in the science department are:—Mathematics, physics, chemistry, metallurgy, zoology and comparative anatomy, botany and vegetable physiology, physiology, geology and physiography, mining, and civil, mechanical, and electrical engineering. Evening classes are held. Secretary, Mr. Geo. H. Morley.

Bristol.—*University College.*—The science course here is excellent. Secretary, Mr. James Rafter.

Cambridge Technical Institute.—Apart from the science classes at the Colleges of the University those who wish to study elementary science are excellently provided for by the Cambridgeshire County Council's technical education scheme. There are similar schemes throughout the country, and it may be useful to indicate here what the Cambridgeshire County Council do. In the Cambridge Technical Institute itself the subjects taught include agriculture, botany, chemistry, hygiene, magnetism and electricity, mathematics, physiography, and sound, light and heat. These classes are held chiefly in the evening, but there are special classes on Saturdays and at other convenient times for the purpose of instructing those who are to teach the subjects in the evening continuation schools, and in special classes to be opened in the villages and towns of the county. Agriculture, botany, and hygiene are the subjects which appear to be most popular, or may be made so, in these rural districts, and those connected with pharmacy who attend the central classes for the purpose of assisting them in their own examinations should keep in view the possibility of their taking up teaching or lecturing in the rural districts—a thing which we know many chemists and druggists to do successfully. Full particulars regarding fees, &c., at the Cambridge Institute may be obtained from Mr. Austin Keen, the Organising Secretary.

Cardiff.—*University College of South Wales and Monmouthshire.*—Composition fees, 10l. per session for all science classes. Registrar, Mr. J. A. Jenkins.

Dundee.—*University College.*—Here there are chairs of botany, chemistry, and physics, and the opportunities for study are good. Chemical technology is taught at the Technical Institute. Secretary, Mr. R. M. Kerr. The evening classes at the Y.M.C.A. Science School have already been referred to. Mr. Jas. H. Smith is the Secretary.

Edinburgh.—*Heriot-Watt Institute, Chambers Street.*—Day and evening classes are held in all science subjects.

The *University classes* are open to non-matriculated students; fees, 4l. 4s. per session per subject.

Dr. Stevenson Macadam's courses of chemistry, in Surgeon's Hall, Nicolson Street, are worthy of note.

Glasgow.—*The College of Science (Anderson's)* is one of the best technical education institutions in this country. There are day and evening classes, and the fees are low.

Leeds.—*Yorkshire College.*—The instruction is adapted to the Victoria University degrees and various diplomas, and the technical instruction pertaining to district industries (dyeing, wool-weaving, leather, &c.) is exceptionally complete. Evening and special classes are held. Fees moderate. Secretary, Mr. W. F. Husband, LL.B.

The classes at the Leeds School of Science and Technology, Rossington Street, are referred to on page 385.

Liverpool.—*University College.*—Conditions and classes are similar to those at Leeds. Registrar, Chevalier Londini.

London.—*King's College, Strand, W.C.*—The instruction provided here is excellent, but expensive. There are classes in all branches of chemistry, metallurgy, photography,

bacteriology, &c., and a new department in public health for analysts (see page 397). Day and evening classes are held.

University College, Gower Street, W.C.—The science curriculum at this College, while to a certain extent the counterpart of that at King's College, has distinctive features. Chemistry has been a strong subject since Graham lectured here fifty years ago. Professor Ramsay is now the head of this department. The feature of the College is the department of applied science and technology, which is for those who intend to be engineers or architects. The common fee for lectures is 4l. 4s. per session. Secretary, Mr. J. M. Horsburgh, M.A.

London is well supplied with science schools, besides those which we have mentioned, but it is not possible to mention more than a few in this place. One of the oldest is the Birkbeck Institute, in Chancery Lane, which was one of the first schools in the country to popularise scientific education. The classes are held in the evening, and the fees are low. We have already mentioned the Finsbury Technical Institute (page 396). There are Polytechnics in Regent Street, W., and in the Borough; while the City of London College, the People's Palace, Mile End Road, Goldsmith's Institute, New Cross, and Charterhouse College provide cheap education in evening classes.

Manchester.—*Owens College* is the principal educational establishment and one of the oldest science schools. Scientific training of a high order is provided in day and evening classes. Secretary, Mr. H. W. Holder.

Newcastle-upon Tyne.—*Durham College of Science.*—Excellent scientific education is provided here, in accordance with the requirements for the degrees (page 397). The courses on agriculture, forestry, engineering, &c., are good. Fees are moderate. Day and evening classes are held.

Nottingham.—*University College.*—The education provided is well adapted to the needs of local industries, and the fees are moderate. A prospectus, price 1d., may be obtained from Mr. J. Sands, St. Peter's Gate, Nottingham.

Sheffield.—*Firth College.*—Day and evening classes in most science subjects are held at low fees. The feature of this College is the metallurgical department.

Sunderland.—*Higher Grade School.*—The classes at this school are divided into four distinct departments, of which the pupil-teachers' central classes, including a science school of 140, and evening science and art classes only interest us. The latter are held during the winter months, and embrace a wide scheme of science work. The pupil-teachers' central school and the evening classes are under the direction and supervision of Mr. F. Woodward.

SCHOLARSHIPS AND HONOURS IN PHARMACY.

The Pharmaceutical Society of Great Britain annually offer three scholarships for competition—viz., two Bell scholarships of the annual value of 30l. and free education in the School of Pharmacy, and one Manchester Association scholarship, the value of which is about 30l., but without free education. For the former all registered students of the Society between 20 and 22 are eligible, but for the latter only those residing in Lancashire, Cheshire, or the High Peak Parliamentary Division of Derbyshire, and between the age of 19 and 21. The examination for the scholarship is held on the second Tuesday of July, at the Preliminary examination centres. Candidates must apply to Mr. Richard Bremridge, 16 Bloomsbury Square, W.C., on or before June 1, lodging with him certain certificates as to good character, three years' service in pharmacy, &c. The examination is in English, arithmetic, Latin, including Virgil or Caesar, and medical Latin, French, or German, elementary chemistry, botany and pharmacy. A certain percentage of marks (two-thirds) must be taken, otherwise the scholarships are not awarded. Hitherto no one has qualified for the Manchester Association scholarship, which need not necessarily be held in the School of Pharmacy, but in any school approved by the Pharmaceutical Council, and there is no doubt that if anyone were successful, he would be allowed to attend, for example, the pharmaceutical classes at the Owens College, Manchester.

A fourth scholarship—viz., the Redwood Research scholarship—is annually awarded to a pharmaceutical chemist by the Pharmaceutical Council. This is of the value of 20l. or

thereabouts, and the holder is expected to spend a year in the Research Laboratory. So far the scholarship has been awarded yearly to the best man in the School of Pharmacy.

The Owens College, Manchester, offers an exhibition of 10% for competition amongst those entering for the full pharmaceutical course therein. The subjects of the examination are elementary chemistry and botany. A scholarship of 10% and a prize of 5% are also open at the end of the winter session. For particulars apply to Mr. H. W. Holder, M.A., Owens College.

Herbarium Prizes.—The Pharmaceutical Society offer annually silver and bronze medals and certificates to students of the Society under 21, submitting for inspection herbaria of British plants collected between January 1 one year and July 1 in the year following, the specimens being properly mounted, named, and arranged according to the recognised system of classification. Number is not so much aimed at as the quality of the specimens, and the intelligence shown in classifying them. The award is made according to the merit of the collection. Thus, if only one herbarium is submitted and the judge thinks it worth the silver medal, that medal would be awarded as freely as nothing at all.

Council Prizes.—After the July examination each year, all those who have passed the Major examination in October, January, April, and April preceding, as well as at the July examination, and who at the time of passing the examination were associates of the Pharmaceutical Society, are invited to compete for certain prizes offered by the Pharmaceutical Society. These consist of the Pereira medal, in silver and books, value 5%.; the Council silver medal and books, value 3%.; and the Council bronze medal and books, value 2%. The examination is in chemistry, botany, and materia medica, the nature of the questions being similar to those given at the Major examination, but requiring some acquaintance with current scientific literature, and such an appreciation of Major subjects as will show that the candidates are of exceptional ability. The Pereira medal is regarded as the blue ribbon of pharmacy. Only about a dozen candidates go in for these prizes every year, and it is to be regretted that the number is not larger, especially that those who pass early in the year do not devote the rest of the year to keeping up their knowledge and preparing for this examination, the honour being a high one, and well worth trying for.

The Research Fellowship of the Pharmaceutical Society is conferred upon pharmaceutical chemists who have worked in the Society's Research Laboratory, and published, or submitted to the Research Committee, a thesis containing the results of some research carried on by the applicant independently. It is unnecessary to give particulars of this, as so far the Society has conferred the Fellowship upon one person only, and applications made by others have, we understand, been refused. In the Research Laboratory of the Society there is at present a Research scholar, who receives 100% a year from the Salters' Company. This scholarship is expected to be available in another year or two.

Analytical Prizes.—Every month the proprietors of THE CHEMIST AND DRUGGIST offer for competition by students of chemistry and pharmacy two book prizes, which are awarded to those sending in the best report of a qualitative analysis of a mixture of salts sent to those who apply for it. We report on one of the competitions in this issue.

APPOINTMENTS.

There are comparatively few appointments open for pharmacists in the public service. The best of these in question are the Naval Hospital dispenserships, which are open to those who have passed the Minor and Major examinations of Great Britain, or the Licence examination of the Pharmaceutical Society of Ireland. There are fourteen appointments in all, viz.:—Haslar, 4; Plymouth, 3; Haulbowline, 1; Chatham, 1; Malta, 1; Cape of Good Hope, 1; Jamaica, 1; Bermuda, 1; Hong-Kong, 1. Candidates must not be over 25 years of age. Pay begins at 5s per day, and rises to 10s., with some allowances and quarters. Dispensers serving at Malta and the Cape of Good Hope get 2s., at Jamaica and Bermuda 3s., and Hong-Kong 4s. additional per day. Dispensers are provided with quarters or with the equivalents thereof, and the keepers of stores receive an extra payment (1s. or 2s. per day), but pharmaceutical chemists

only are appointed to these higher positions. We are not aware whether Irish pharmaceutical chemists will be eligible for these higher appointments, as the regulations to admit them are at present undergoing revision. It may be said in regard to naval-hospital dispenserships that the persons holding them are, after ten years' service, entitled, provided they are recommended by the medical committee or the head of the department, to pensions at the usual rate obtaining in the Civil Service—viz., $\frac{n}{60}$ of the salary they were receiving immediately on retiring (n = number of years served), the maximum being forty-sixtieths, as forty years' service is the limit. Applicants for these appointments should apply to the Director-General of the Medical Department of the Navy, 21 Northumberland Avenue, London, W.C., giving him full particulars as to their pharmaceutical qualifications and experience, and accompanying these with copies of any available testimonials regarding good character and business ability.

Compounders in the Army must be members of the Medical Staff Corps, who have received stripes and passed an examination conducted by the medical officers. The duties are not liked by chemists' assistants, for they are but slightly medical and pharmaceutical. We hope to print the observations of a representative in an early issue.

Poor Law Dispenserships are open to chemists and druggists, Irish pharmaceutical chemists, apothecaries, apothecaries' assistants, and members of the Medical Staff Corps (retired). These appointments are generally advertised in THE CHEMIST AND DRUGGIST SUPPLEMENT as they become vacant. They are of the annual value of 120%., increasing by increments of 5% to 150% per annum. There are not as a rule any perquisites, but in times of excessive work the Local Boards of Guardians may pay a dispenser a small honorarium when there has been exceptional hard work. The duties consist of dispensing for the poor in the work-house infirmaries, occasionally for the out-door poor, and keeping the stock of medicines in good order, and making galenical preparations. Dispensers are assisted by one or more of the pauper inmates, who do the rough work.

The Dispensers in Prisons are paid about a similar rate and are only open to chemists and druggists, but those holding them reside in the prison, and must be prepared to assist the warders in their peculiar duties.

MEDICAL APPOINTMENTS.

The Army and Navy offer good facilities to young medical men—i.e., those between 21 and 23 years of age. Altogether there are four classes of Government medical appointments:—

(1) The Army Medical Staff is open to men who are licensed to practice medicine and surgery. The appointments are competitive, the examinations being held twice a year. The subjects are—(a) Anatomy and physiology; (b) surgery; (c) medicine, including therapeutics, and the diseases of women and children; (d) chemistry and pharmacy, and a practical knowledge of drugs, with French, German, and natural sciences as optional subjects. The pay begins at 8s. a day to surgeons on probation, exclusive of allowances, the rate of pay increasing with increase of rank to 650% a year to surgeon-majors, and 1500% to the director-general of the department. The retiring allowances are as follows:—After ten years' service, 1,250%.; after fifteen years' service, 1,800%.; after eighteen years' service, 2,500%.; after twenty years, a pension of 1% to 2% per day. Communications in regard to this department should be addressed, "The Adjutant-General to the Forces, Horse Guards, War Office, Pall Mall, London, S.W. Medical Division."

(2) The Indian Medical Service appointments are made in the same way as the preceding, and the successful candidates also go to Netley, where they attend the Army Medical School, and after passing the examination in special subjects taught there, they are appointed to any position which may be vacant in India, the order of the candidates on the pass-list determining their choice of the vacant positions. As in the home service 8s. daily is the rate of pay at Netley, and on appointment as surgeon-lieutenant, 10s.; on landing in India the pay begins at the rate of 317s. 8d. per month, and so on according to position in the service. Officers of the Indian Medical Service are allowed to retire on the following

scale of pension, on completion of the required periods of service:—

	Per annum.
	£
After 30 years' service for pension ..	700
" 25 " " " ..	500
" 20 " " " ..	385
" 17 " " " ..	292

The British rate of half-pay is granted to those not entitled to pension who are placed on temporary or half-pay. The Military Secretary, India Office, London, S.W., is the man to write to in regard to the next appointments (twelve in February, 1896).

(3) The medical department of the Royal Navy admits the same class of candidates to the naval service. The examination subjects are the same, but the optional subjects of the examination, which give the candidate the chance of a better position, are more numerous. Successful candidates are trained at Haslar, and at the conclusion of the period of study they must pass an examination. Pay in the service begins at the rate of 209*l.* 17*s.* 6*d.* yearly, and allowances. On retiring, after eight years' full-pay service, the gratuity is 1,000*l.*, at sixteen years 2,250*l.*, and after twenty years a pension is paid at the rate of from 1*l.* to 2*l.* a day. All communications to be addressed—Director-General, Medical Department, Admiralty, Northumberland Avenue, London, W.C.

(4) The colonial medical service is not competitive. Applicants must be between 23 and 30, doubly qualified, of good moral character and physique. The appointments are in the following colonies: British Guiana, Jamaica, Trinidad, Windward Islands, Leeward Islands, British Honduras, Fiji, Sierra Leone, Gambia, Gold Coast, Lagos, Ceylon, Straits Settlements, Hong-Kong, Cyprus, Gibraltar, St. Helena, and the Falkland Islands. In Ceylon and Jamaica vacancies are almost always filled locally by the appointment of qualified native candidates. It is for the West Indies and the West African colonies that medical officers are chiefly required. Pay begins at 300*l.* to 500*l.* per annum, according to the colony, and may increase to 1,000*l.* About fourteen vacancies occur every year and eighty applications for them. Applications from persons in the United Kingdom must be addressed to the Private Secretary, Colonial Office, Downing Street, London, S.W., during the month of April in each year.

New Companies and Company News.

CRESCO-FYLMA COMPANY (LIMITED).—Capital 10,000*l.*, in 1*l.* shares. Objects: To acquire certain inventions in photography, to enter into an agreement with A. J. E. Hill, and A. A. Barratt, and to carry on business as photographic dealers, chemists and manufacturers. The regulations of Table "A" mainly apply. Registered offices, 14 Sherborne Lane, E.C.

F. J. MARTIN & CO. (LIMITED).—Capital 2,500*l.*, in 1*l.* shares. Objects: To carry on business as lead, glass, oil and colour merchants, paperhangers, ironmongers, chemists, druggists, and dealers in artists' materials. The principal subscriber is G. A. Worthington, 40 St. David's Road, Southsea, oil and colour merchant, who holds 2,494 shares. Registered without articles of association.

OXYGEN PATENTS (LIMITED).—Capital 5,000*l.*, in 1*l.* shares (20 Founders'). Objects: To acquire the machinery and plant erected for the purpose of producing oxygen gas at 31 Eagle Wharf Road, London; to purchase and turn to account patents dealing with the manufacture of such gas; and to carry on business as oxygen manufacturers and practical chemists. The first directors (to number not fewer than three nor more than seven) are such of the allottees of the first ten Founders' shares as shall desire to act. Qualification, twenty-four Ordinary and one Founders' shares.

THOMAS READ PHILP & CO. (LIMITED).—Capital 500*l.*, in 1*l.* shares. Objects: To acquire and carry on the business of a chemist, druggist, grocer, &c., carried on by Joseph Philp, deceased, at Wadebridge, Cornwall, and to enter into an agreement with Susan R. Philp for the purpose. The first subscribers are:—T. R. Philp, grocer (494); Susan R.

Philp, spinster (1); John Warren, gentleman (1); E. B. Philp, widow (1); P. Lockett, butcher (1); J. Williams, gentleman (1); R. J. E. Symons, solicitor (1), all of Wadebridge. The first directors (to number not less than three nor more than five) are:—Thomas R. Philp, Elizabeth A. B. Philp and Susan R. Philp. Remuneration, as the company may decide.

THE SCOTTISH OIL AND CHEMICAL COMPANY (LIMITED).—Registered in Scotland. Capital 30,000*l.*, in 1*l.* shares, of which 3,000 are deferred as regards capital and dividend. Objects: To enter into and carry into effect an agreement, dated August 23, 1895, made between Andrew Charles Joseph Charlier and Adam Hutchison, as trustee for the company; to carry on the trade or business of manufacturers of white-lead, and of all classes and kinds of colours, paints, varnishes, greases, oils, and chemicals, used in painting and other kindred trades; to purchase, lease, or otherwise acquire all lands, mines, mining-ground, metals, and minerals, or any buildings, plant, or other property necessary to the advantageous possession and use of the mines and works of the company; to erect, construct, or purchase mills, engines, boiler-houses, shafts, &c. First directors: John Currie, cotton-yarn merchant, Glasgow; Robert S. McNicol, cotton-yarn merchant, Glasgow; and John Raeside, merchant, Glasgow, and two more directors to be chosen by them. Registered office, 95 Hope Street, Glasgow.

The directors of Taylor's Drug Company (Limited), after paying interest on debenture capital, preference-share dividend, and writing off depreciations on plant and fixtures, &c., have declared a dividend of 20 per cent. on the ordinary share capital for the year ending June 30. They carry forward 1,539*l.*

S. A. SADLER & CO. (LIMITED).—The directors of this company, whose chemical-works are situated at Middlesbrough, have issued their report for the year ending June 30 last. It shows a profit of 25,509*l.* 3*s.* 8*d.*, of which 5,417*l.* is set aside for interest on debentures and prepaid shares, at the rate of 12*s.* 9*d.* a share; dividend on 14,382 shares at 7*s.* 6*d.* per share, 5,393*l.* 5*s.*; depreciation, 4,236*l.*; directors' and auditors' fees, 850*l.*; to reserve fund, 2,500*l.*; and balance, 7,112*l.* 4*s.* 10*d.* The accounts show a large reduction in the amount owing by the company as compared with previous years.

Personalities.

MR. STEPHEN HARRIS, chemist, of Droitwich, has been elected Vice-Chairman of the Droitwich School Board.

MR. JOHN FAULKNER BARKER, chemist and druggist, Lancaster, was on Saturday admitted to the freedom of the borough by the Mayor, Mr. R. Preston.

MR. HAROLD GREENWOOD, youngest son of Mr. J. I. Greenwood, chemist and druggist, High Street, Woodville, has gained a scholarship of 40*l.* per year, tenable for three years, at Durham University.

MR. A. J. FREELAND, chemist, Kibworth, Leicestershire, has written a comic ditty for the trade, and set it to music. This is not Mr. Freeland's first essay with the lyre, and in "Fiat Mistura" he gives us a song which deserves to become known at all social gatherings of the trade. There are four verses of it, and we take the liberty of quoting one of them appropriate to the character of this number.

But now, alas! those days have gone. His ninety-nine of yore
Has been reduced to one per cent., and he works—well, ten times more.
He crams his head with sciences, and rubbish more or less,
Before he can assume by law the title A.P.S.

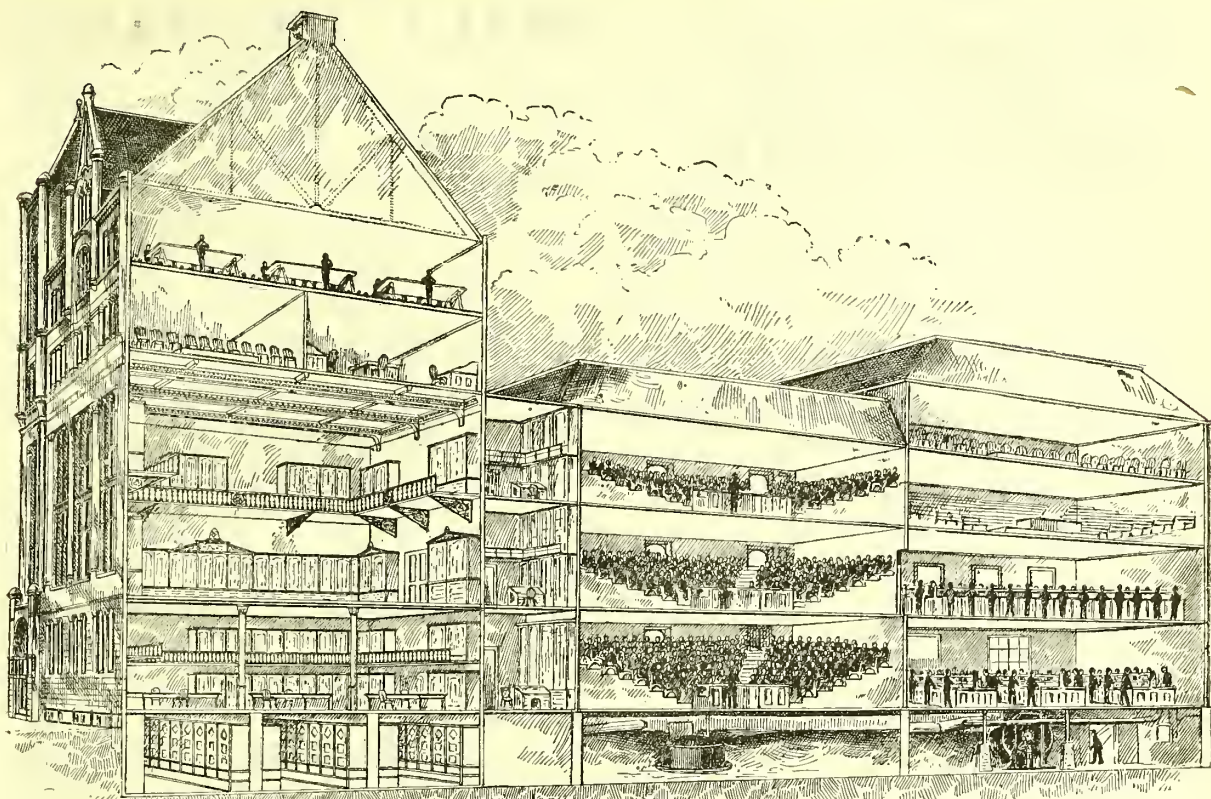
Fiat mistura, embryo chemist,

When you've a minute to spare,

Make up your pills, your plasters, and ointments

Ready for Bloomsbury Square.

The song ends up happily and hopefully, and the music is brisk and catchy.



BASEMENT.—Students' Lockers, Oxygen and Hydrogen Gasometers, Steam Heat Plant.

GROUND FLOOR.—Library, Actuary's Office, Professor Sadtler's Office, Chemical Lecture Room, Chemical Laboratories.

FIRST FLOOR.—Museum and Assembly Hall, Professor Remington's Office, Pharmaceutical Lecture Room, Pharmaceutical Laboratories.

SECOND FLOOR.—Museum Balcony, Professor Bastin's Office, Materia Medica and Botany Lecture Room, Assistant Professor's Review and Quiz Room.

THIRD FLOOR.—Alumni Hall and Meeting Room, *American Journal of Pharmacy* Offices, Janitor's Quarters, Microscopical Laboratory.

FOURTH FLOOR.—Examination Room.

FIFTH FLOOR.—Storage Rooms.

AMERICAN PHARMACEUTICAL EDUCATION.

TO-DAY we print some sketches of the exteriors and interiors of several British schools of pharmacy, all of them, with the exception of the Pharmaceutical Society's school, being the outcome of the efforts of their proprietors to provide instruction for the examinations instituted by the Pharmacy Acts. In contrast with these we present above an interior view of the Philadelphia College of Pharmacy buildings, one of the best and largest institutions of the kind on the American continent. The front of the premises, shown at the left of the engraving, is a new structure which was finished for occupation in 1893, while the back portion was built in 1868, enlarged in 1880, and remodelled in 1893.

Each of the lecture rooms is seated for 300 students, for everyone of whom there is a comfortable arm-chair and sloping desk for note-taking. In addition to the laboratories shown, a histological one has been added since Professor Maisch's death. The practical pharmacy laboratories have bench accommodation for 250 students, and in the chemical laboratories there are eighty tables for as many students, apart from the provision for special students, about twenty of whom take a post-graduate or research course yearly. The laboratories are excellently appointed.

The sessions of the College begin on October 1, and last until the April following. All students proceeding for the diploma must attend the College at least two sessions, the first one comprising the junior course and the second the senior, so that there are always two sets of students working simultaneously. The lectures are delivered in the evening, juniors and seniors attending on alternate nights. The following is the diary of the week:—

Monday (seniors), 5 to 6, chemistry review; 7.30 to 8.30, pharmacy lecture; 8.40 to 9.40, chemistry lecture; 9.45 to 10.45, chemical review (for those who have not attended earlier).

Tuesday (juniors), 5 to 6, pharmaceutical review; 7.30 to 8.30, materia medica and botany lecture; 8.40 to 9.40, pharmacy lecture; 9.45 to 10.30, pharmaceutical review.

Wednesday (seniors), same as the Tuesday arrangement.

Thursday (juniors), same as the Monday arrangement.

Friday (seniors), 5 to 6, materia medica review; 7.30 to 8.30, chemistry lecture; 8.40 to 9.40, materia medica and botany lecture; 9.45 to 10.30, materia medica review.

Saturday (juniors), same as the Friday arrangement.

Students attend for practical work during the day, the chemical laboratories being open from 9 A.M. to 1 P.M., and the pharmacy from 9 to 12; but there are classes for such work in the afternoon at 2 and 3, which all must attend on certain days of the week. There are between 600 and 700 students at the College, from which fact it will be understood that there must be considerable division in order that the whole of them may receive adequate practical instruction. It is obvious, therefore, that the school is not a night one in the proper sense of the term, although most of the work is done in the evening.

The following are the fees for the two years' course:—

	\$	£	s.	d.
Matriculation	5	1	1	0
Lectures in chemistry, pharmacy, and materia medica and botany, \$15 each; course ..	90	18	18	0
Review-quizzes	21	4	8	0
Practical pharmacy	40	8	8	0
Practical chemistry	30	6	6	0
Histology	10	2	2	0
Examination fee	15	3	3	0
	\$211 = £44 6 0			

In addition to the foregoing, there are fees for individual instruction in chemistry and pharmacy, so that 50l. at least may be put down as the cost of the curriculum and diploma.

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NOVEL "COUNTER ADJUNCT" FOR SEPTEMBER.

See page 57.

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 disturbance of digestion.

EDUCATION.

It can only be the most pessimistic of Englishmen who
 regards British education with disfavour. We do not say
 that the arrangements for the education of all grades, from

the workman's child of five to the research fellow in Oxford, are perfect, but everywhere progression in quality and quantity is evident. Englishmen are beginning to realise what their compatriots in other parts of the kingdom and American educationists have long done—that the public-school system has many evils, not the least of which is adherence to methods that suited pre-railway days, and are now eminently unfitted for those who have to compete with the world's best men. So there have been springing up during the past generation many excellent schools in which the methods are not at all insular, while nearly all the great historic schools have remodelled their curricula to suit modern notions. The most significant features of our educational system are, however, the institution of free education and the development of technical education, the latter really incorporating secondary education. It would be foolish to take this as an unmixed blessing at present; no transitional period is ever enjoyed by all concerned in it, and neither the present generation nor the next will fully realise the benefit of all that is now being done in this country to foster the education of the masses.

A year ago Sir Henry Roscoe, as Secretary of the National Association for the Promotion of Technical Education, was able to report that at that time there were sixty-nine technical schools in course of erection throughout England. This is the direct result of the scheme inaugurated by Mr. Goschen five years ago, when he set aside a part of the revenue, now amounting to about 1,000,000*l.* a year, for the purpose of fostering technical education through the County Councils. This has been the means of starting a large number of county centres for scientific and technical education, and carrying teachers to the quietest villages in rural districts. In time the effect upon British industries, both agricultural and mechanical, is bound to be beneficial, and, so far as pharmacy is concerned, there is no longer any excuse for chemists' apprentices not studying the sciences during their indentures. Elementary though some of the rural classes may be, they are sufficient to give the apprentice that interest in the sciences connected with pharmacy which is necessary to make him a good pharmacist. This is a matter which we commend to all employers of apprentices.

In our own department of education there is little change to note this year. Private effort chiefly provides the means of preparing for the pharmaceutical examinations, and, so far as Great Britain is concerned, we observe that there are a few new ventures this year, and we seem to miss one or two old schools. When we contrast, as we have occasion to in this issue, American with British pharmaceutical education, our country makes a comparatively poor show. One could pack all the schools of pharmacy in Great Britain in the Chicago, New York, and Philadelphia colleges of pharmacy, and there would still be room for more. The inference is that the United Kingdom is behind the United States; but we do not think this is so. The fact is that the methods of training in the two countries are entirely different. With us students have served, on an average, five to six years in a pharmacy before they enter upon that final stage of preparation for the qualifying examination which we call the curriculum, for the want of a better word. But education in most cases has been proceeding for two or three years before, evening classes in chemistry, botany, and physics giving that grounding which makes a four months' whole-day course adequate for the Minor. In the United States a three years' apprenticeship is the rule; but we have it on American authority that there is much exception. Indeed, the custom of young fellows going to a college of pharmacy after one or two years' shop experience has become so general that a leading pharmaceutical professor there advocates replacing

apprenticeship by a three years' course in a college. Considering the conditions there is much to be said for his proposal. We can sum up the two systems in one sentence: In the British shop-training is long, school-training short; and in the American *vice versa*. We get to the same point by different ways.

Nevertheless, when we view the results of recent examinations, the inadequacy of our educational arrangements to the examination requirements becomes prominent. Students or teachers have not kept pace with the changes in the examination system, and the consequence is an exceptional proportion of failures. This particularly applies to London, where there seems to be a tendency for the professorial examiners to put on the screw. As long as this is done within schedule limits it is commendable, for it is the best thing to force apprentices and junior assistants to begin the study of botany, chemistry, and physics while they are in their teens, and so prepare themselves for the specialised instruction which they receive in schools of pharmacy. We do not think the failures show the need of such a compulsory curriculum as the Pharmaceutical Council at one time advocated. In such a calling as pharmacy, where the practical training of the shop is the keel of the craft, we should deplore anything which would imperil the essential feature of the British system and drive us to the American method. We do not anticipate anything of the kind; but we cannot forget that the Pharmaceutical Society's requirement of evidence of three years' experience in dispensing medical prescriptions has now become the standard period for apprenticeship, instead of the old-fashioned five years, and we feel sure that the prolongation of the period of school training would bring with it further shortening of apprenticeship. If pharmacy ever has a compulsory curriculum it will be difficult to get beyond the three years at present recognised, the period including both shop and school training. It will be observed that the dental curriculum, consisting of pupillage and collegiate training, is now definitely put down at four years—*i.e.*, the pupil may reckon the curriculum from the day he begins apprenticeship should he have passed the Preliminary examination. The curriculum has not actually been shortened, but the Medical Council has recognised the principle that the whole of the time a man spends in the pursuit of his calling should be reckoned for qualification.

In spite of the fact that the medical curriculum now extends to five years, it will be seen that the tendency still remains to eliminate the sub-medical subjects from that period, and so bring the strictly medical part down to four years, the last of which is devoted to medical and surgical practice. These circumstances favour the view that we would do well to keep pharmacy upon its strictly practical basis. It will not make a good hybrid, and the American professor's policy of school-training first and practical experience afterwards is too exotic for our rigorous climate.

THE INLAND REVENUE RETURNS FOR 1894-5.

THE thirty-eighth annual report of the Commissioners of Inland Revenue, which has just been published, contains a few statements of interest to pharmacists. The total net receipt of Inland Revenue in the year ending on March 31, 1895, was 59,593,750*l.*, an increase of 2,780,165*l.*, or about 4½ per cent., on the revenue of 1893-4. Two-thirds of this is accounted for by the increased death-duties, the remainder by the revised income-tax and the increased duties on beer and spirits.

Alcohol in all its forms being the chief contributant to

our national income, it would be only meet and fitting had the Commissioners devoted the bulk of their report to statistics on spirits. In proportion to its importance as a source of revenue, however, alcohol occupies but a very small part of the report. The quantity of spirits distilled in the United Kingdom in 1894-5 was slightly smaller than in the preceding year—44,870,357 gallons, against 44,948,194 gallons in 1893-4. Scotland produces just one-half of this quantity, England rather less than a quarter. In the number of distilleries, however, Scotland outruns the sister kingdoms altogether, inasmuch as she boasts of 132 such establishments, while England has only 11, and Ireland 27. The export trade in British spirits has increased largely—from 3,548,626 gallons in 1894 to 3,854,102 in 1895. Australasia and South Africa especially signalised the advent of better times by deeper libations of British fire-water.

The figures relating to the quantity of spirits received for methylation are interesting—Scotland and Ireland showing slight decreases under this head, which, however, are more than balanced by the increase in methylation in England. Here are the returns:—

Year ending	England gallons	Scotland gallons	Ireland gallons	Total gallons
March 31, 1895	3,180,734	371,480	34,789	3,587,003
„ 31, 1894	3,124,308	384,107	35,171	3,543,586

An interesting table is given of the quantities of spirits, beer, wine, tea, coffee, and cocoa consumed per head of the population since 1852. It shows a steady decrease in the consumption of British spirits (0.918 gallons in 1852, 0.770 gallons in 1894), a slow advance in the consumption of foreign and colonial spirit (0.177 against 0.196 gallons), and an increase of 50 per cent. in the consumption of wines. We also consume much more beer per head of the population than formerly, and of tea we now drink on an average, 5.525 lbs. per year per head, against 1.993 lbs. in 1852. The use of coffee is only half of what it was, but that of cocoa has quintupled.

The returns relating to the patent-medicine-stamps are naturally those which will interest pharmacists more than any other figures in the book. They show a considerable advance—viz., from 213,210. in 1893-4 to 234,881. in 1894-5. The last-named amount represents no fewer than 3,467,360 packages of 1s. 1½d. patents. In view of the remarkable declines during the previous few years, which we have had occasion to note on more than one occasion, this decided return to the upward grade is significant. There is nothing in health statistics to account for it, and we suppose that the makers have found their sales on the decline, and counteracted that tendency by more liberal advertising. The fact that the revenue from Bill of Lading stamps in the United Kingdom in 1894-5 was 65,700%, against 66,000% in the year before, whereas that from mortgage stamps increased from 177,967% to 189,585% in the same period, is indicative of the trade-depression through which the country has passed, and in this connection it may also be mentioned, as a sign of the increasing tendency to speculation, that the receipts from stamps on the transfer of stocks and shares has risen from 743,000% to 1,130,000%. In 1894-5 3,197 joint-stock companies were registered; in 1893-4 only 2,570.

The revenue from licences for stills used by “chemists, &c.,” was only 420%. In England 670 such licences were granted, in Scotland 123, and in Ireland 25. The patent-medicine vendors’ licences brought in 7,561%, 27,950 such licences being taken out in England and 2,284 in Scotland. The

following returns, under the head of excise licences, may also be of interest:—

	England	Scotland	Ireland	Total
Methylated spirits (makers) ..	21	2	1	24
„ „ (retailers) ..	10,429	1,171	504	12,104
Distillers and rectifiers ..	200	160	60	420
Vinegar-makers ..	147	6	3	156

The work of the Inland Revenue branch of the Government laboratory is steadily increasing—at any rate, so far as concerns the number of samples analysed. The following are the comparative statistics for the two last years:—

Description of Samples	1894	1895
Tobacco	1,221	1,451
Snuff	915	847
Tobacco, bonded and other ..	49	83
„ moisture	12,011	12,236
Snuff	23	26
Beer (original gravities) ..	9,372	10,001
Beer and beer adulterants ..	2,820	2,838
Worts (beer duty)	10,010	11,938
Coffee and chicory	53	60
Naphtha, wood for methylation ..	773	743
„ mineral for methylation ..	171	168
Alcohol for methylation	74	66
Compounds, liqueurs, and wines ..	1,588	1,535
Spirits (obscuration)	34	20
Tinctures	5,575	5,806
Miscellaneous	1,686	1,639

The figures relating to “tinctures” contain the whole of the information vouchsafed by the Department with regard to the working of the drawback regulations. All they show is that the trade is steadily increasing. The Board of Trade also does some analysing—viz., of the lime and lemon juice, spirits, and fortified juice supplied to the Navy. Last year they analysed 563 samples of these commodities, representing 68,287 gallons, of which 24 samples, representing 2,634 gallons, were rejected.

COMMERCIAL AND ECONOMIC TRAINING.

FOR nearly a century Great Britain has occupied the first place among the commercial nations of the world in respect to the volume of her trade. There are many signs that she may not continue to do so very much longer, although it does not follow that even if she should cede the place to the United States, or share it with Germany, the national well-being must necessarily suffer. It is extraordinary, however, that England should have so long held her foremost position in spite of the inadequate facilities for theoretical commercial and economic training. The vast majority of the commercial classes of this country have migrated straightway from an elementary or intermediate school into a counting-house, there to pick up, as best they could, an acquaintance with the particular branch of business to which chance rather than choice guided them, and some general notions of commerce in general. In this respect Englishmen have long been at a disadvantage with their continental competitors, of whom a large proportion have received careful and systematic higher training in theoretical commerce, and, to some extent, in economics, in special commercial schools. In America, too, considerable attention has of late been paid to mercantile training in schools. The Columbian College diploma is sought by many of the best pupils of the American Business Colleges. There are several hundred of these institutions throughout the United States, and not fewer than 75,000 young men and women are annually trained in them in business methods by 3,000

teachers, some of whom are actually in commerce. The peculiar conditions of American trade, and the tendency of the people to fall quickly into the commercial spirit, do not favour the teaching of the elementary details of business method in business. Hence have arisen these colleges, whose purpose it is to teach those leaving elementary schools all the mysteries of buying and selling, including book-keeping, invoicing, discounts, freight allowances, and the hundred and one things which occur in a well-regulated business house. The colleges have regular counting-houses attached to them, where the pupils have desks, attending to callers, inquiries, correspondence, payments, &c., in quite a serious fashion. Most of the colleges in the States are in correspondence for business purposes, under the style "International Business Practice Association." The pupils of these carry on an enormous volume of mimic business—soliciting orders, despatching goods, invoicing, corresponding in reference to overcharges, quality, returns, and so on; paying cash and getting discounts, or drawing up bills for the amounts, and all this with a mere shadow of the merchandise (it really takes the form of little tickets), but still substantial enough to teach the methods of business and to make a young man or woman in the course of a year or two worth \$15 a week to any business house.

In the matter of commercial education, however, England has persistently adhered to the Goethean view that all theory is grey, but ever green the golden tree of life, although of late years some attempts have been made by public bodies to follow on continental lines. One of the most promising of these is to be commenced next month, when the London School of Economics and Political Science will open its doors. Though it is mainly intended for students of political economy, we desire here specially to emphasise the opportunities for higher theoretical commercial training which the school will afford. As to the college itself, the bulk of the money required for its establishment is derived from a bequest of several thousand pounds left by an English student of economics, Mr. Hutchinson, who died about a year ago. This capital is placed under the control of trustees, who include one of the most active and best-known members of the London County Council. Its yield is to be applied solely to the scientific and systematic teaching of the subjects indicated in the title of the school, and will be supplemented for the purpose by an annual grant of 500*l.* from the London County Council, by assistance in the shape of the gratuitous loan of rooms of the Society of Arts, and by the "moral support" of the commercial side of the school by the London Chamber of Commerce. The last-named body was first seized with a sense of the responsibilities attached to it as the greatest organisation of commercial men in the kingdom about two years ago, when it took to awarding certificates for proficiency in commercial subjects, and, as a matter of course, to examining. It has also established a kind of mercantile employment-bureau. We have never felt an exaggerated respect for the manner in which the London Chamber of Commerce fulfils its functions, nor are we disposed to place a high value upon its present power for usefulness as an educational body. Therefore, until it rids itself of the bureaucratic cerecloth in which it is now securely wrapped, the wisest thing it can do is to give cordial support to an organisation qualified and prepared to do what the Chamber itself cannot attempt. As for the Society of Arts, it is pleasing to find that ancient and rather venerable institution associating itself with a movement of a pronouncedly modern and advanced character. Its rooms will be useful, and possibly it will decide to set aside a few of the superabundant medals which it is now in the habit of awarding for papers of varied merits as an

encouragement to assiduous students. The school will be placed under the direction of Mr. W. A. S. Hewins, M.A., of Pembroke College, Oxford, who will be assisted by a staff of thoroughly qualified teachers. The subjects are divided into nine branches—economics, statistics, commerce, commercial geography, commercial history, commercial and industrial law, currency and banking, taxation and finance, and political science. Fees are low, and the courses of lectures, which will form an important feature of the school in addition to the classes, and will principally appeal to advanced students, are all to be given in the evening. We hear with much relief that it is not proposed to prepare students especially for any examination, but the lectures and classes will be found useful to candidates for several examinations. The directors of the school will be glad to receive suggestions of other classes and subjects than those already included in the syllabus, and to give information to inquirers at 9 John Street, Adelphi, W.C., where the school is located.

In addition to the public lectures and classes referred to above, the work of the school will comprise special classes, arranged as a three years' course of study, concluding with a research course; the promotion of original research by means of scholarships or otherwise; the publication of books containing the results of researches; and the organisation of an "information department, to assist British students and foreigners visiting England for the purpose of investigation. There can be very little doubt that the school will be a success.

MR. GERALD BALFOUR'S PRETTY WIT.

Since the death at Hyde last week of the boy who had gone through a course of hydrophobia treatment, yet died of the disease, there has been a big crop of remedies brought forward. The last was revealed to the House of Commons on Wednesday, when Mr. Farrell asked the Chief Secretary for Ireland whether he is aware that Philip Movern, of Glan, county Cavan, claims to possess a specific herbal remedy for the treatment of this disease which has resulted in the cure of thousands of cases since the days of King Charles I., and whether, having regard to the necessity of doing something to cope with the increase of rabies, the Government would cause an inquiry to be made into the efficacy of this remedy, with a view to its adoption and use in some central hospital in Dublin or elsewhere? Mr. G. Balfour replied that he must maintain the same attitude of cautious reserve which, to judge from the hon. member's question, had been observed by every Irish Government from the days of Charles I.

THE PHARMACY OF THE SOUL.

The new subjects which pharmacists have to study to be abreast with modern therapeutics seem to be infinite. Following the animal physiologist with his serums comes Mrs. Victoria Woodhull Martin, in the *Humanitarian*, with a treatise on the Pharmacy of the Soul. This lady is a philosopher of the Greek order; that is to say, she is fond of dogmatising on subjects which are incapable of proof. She is attracted by Aristotle's attribution of the temperaments to physiological causes—the melancholic, for instance, to an excess of bile in the system—and she goes on to quote in unnecessarily laborious sentences other well-known facts, proving how the emotions are influenced by certain conditions of the blood, and how these again affect the secretions. Alcohol, from this point of view, is apparently one of her soul-drugs, but she has only just got to this point when her lecture is adjourned till next month, and if then she can meet Shakespeare's demand for a medicine-chest adapted to the diseases of mind, she will have added a profitable extra to the chemist's stock.

Legal Reports.

PROSECUTION UNDER THE PHARMACY ACT.

At the Sheriff's Court, Edinburgh, on Thursday, August 29, a case came before Acting-Sheriff-Substitute Sym, at the instance of Richard Bremridge, Registrar to the Pharmaceutical Society of Great Britain, in which Robert McCallum was charged with having, on February 27 last, sold a quantity of chloral hydrate and opium to Thomas Allan, in the shop occupied by the Edinburgh and Leith Drug Company (Limited), 4 and 5 Crichton Place, Leith Walk, he not being a qualified chemist; and also with having committed a similar offence on March 6.

Mr. Trotter, advocate, who appeared for the accused, said that before the case was heard he wished to have time to consider some points on the question of relevancy, and as he had only just been instructed in the case he had not had time to look into the question. He asked the Sheriff for an adjournment.

Mr. P. Morison, jun., S.S.C., for the complainant, said he had no objection to an adjournment, but stated that the complaint was in the usual form, and its relevancy had been already several times disputed and had twice passed the Judicial Appeal Court.

The Sheriff, after consultation with the parties, fixed Thursday, September 19, for the adjourned diet, on the understanding that, if the relevancy of the complaint was proved, the trial would be taken on the same day.

ADULTERATION CASES.

SWEET SPIRITS OF NITRE.

At Sevenoaks Petty Sessions, held on August 30, 1895, before Lords Hillington and Stanhope and a full bench of magistrates, Mr. R. Barrat, pharmaceutical chemist, was charged under the Food and Drugs' Act with selling sweet spirits of nitre deficient in nitrous ether. The certificate of the Kent County analyst stated that the sample submitted to him contained only 35 per cent. of nitrous ether instead of 28 per cent. required by the British Pharmacopœia, and that the specific gravity was .850 instead of .845. Mr. Wardley, solicitor, Sevenoaks, who appeared for the defendant, stated that two different preparations were sold under the name, "Sweet spirits of nitre"—viz., the spt. æther. nitrosi of the British Pharmacopœia and spt. æther. nitrici of the London Pharmacopœia, and as the name "sweet spirits of nitre" was not officially recognised in the former book his client had a choice as to which he should supply, and in selling an article made according to the London Pharmacopœia, he contended he was satisfying the demands of the public.

Mr. Thomas H. Henry, pharmaceutical chemist, 17 Bloomsbury Square, gave evidence to the effect that the sample complained of contained 338 per cent. of nitrous ether, and in odour, taste, and chemical characteristics resembled sweet spirits of nitre of the London Pharmacopœia. He further stated that Dr. Leech, of Manchester, had pointed out that the indiscriminate use of spiritus ætheris nitrosi of the B.P. might be attended with some danger to the public, and he said that in his experience the people of the district preferred the spirit of the London Pharmacopœia.

Several questions were asked by the magistrates, which showed that they were totally unable to understand the point raised by the defendant's lawyer. The case was dismissed, however.

IS BEESWAX A DRUG?

At the Bearsted (Kent) Petty Sessions, on Monday, before Mr. C. Whitehead (Agricultural Adviser to the Privy Council) in the chair, and a full bench of Magistrates, John Perrin, a grocer and drug-dealer, of Bearsted, was summoned for selling $\frac{1}{4}$ lb. of beeswax "which was not of the substance and nature demanded by the purchaser," the prosecution being instituted by the police under the Food and Drugs Act.

Inspector Watson, of the County Constabulary, proved the purchase; and Mr. Ellis, for the defence, characterised the

prosecution as a ridiculous one. The defendant, like other country grocers, sold beeswax to persons for polishing floors, and to harness-makers to use in their trade.

The Chairman: You admit, I suppose, that this beeswax comes within the meaning of the Food and Drugs Act?

Mr. Ellis replied that the inspector had not proved that beeswax is a drug, and the Bench had no option but to dismiss the summons. The case was precisely similar to that of *James v. Jones*, which came before the High Court some time ago, and in which the appellant sold to the respondent a packet of baking-powder, composed of 20 per cent. of bicarbonate of soda, 40 per cent. of ground rice, and 40 per cent. of alum, the latter of which ingredients is injurious to health; and the Court held that such baking-powder was not an article of food, and that the sale of it was not an offence within the definition of the Food and Drugs Act.

The Chairman: That case scarcely applies to this one.

Mr. Ellis: I think it does, your worship. It seems to me that beeswax takes about the same place in the making of medicine that baking-powder does in the making of bread. Beeswax, although used in the making of medicine, is not a drug, because it possesses no medicinal qualities, and it does not, therefore, come within the meaning of the Food and Drugs Act. I may mention that this is the first prosecution of the kind which has been instituted in Kent.

The Chairman, after a prolonged deliberation with the other Magistrates, said: We find that the defendant is technically guilty; but, as he may have been ignorant of the Act relating to the sale of this article, we only order him to pay the costs of the prosecution.

YES, FOR IT IS USED IN MAKING PILLS!

A GROCER named Charles Simmonds was summoned before the Newport Magistrates on August 28 for selling beeswax which the public analyst certified consisted of 5 per cent. of natural wax, 8 per cent. of resin, and 87 per cent. of paraffin. The defendant had sold 9 oz. to a detective officer for 10 $\frac{1}{2}$ d. Defendant was represented by Mr. F. Lewis, solicitor, who contended that beeswax was neither a food nor a drug. Defendant had purchased the wax in the usual way at the rate of 1s. 3 $\frac{3}{4}$ d. per lb. He had received from the wholesale agents a guarantee that the wax was pure, and this he handed to the Bench. The Magistrates held that beeswax was a drug, it being used in the manufacture of pills, but they thought the defendant had acted *bonâ fide* in the matter. They considered it was the duty of all tradesmen, however, to see that the articles which they sold were pure. Defendant was ordered to pay the costs.

A SELF-RAISING FLOUR PROSECUTION.

At the sitting of the Guildford Police Court, on Saturday, Mr. E. Bonner stated that on August 7 a summons was issued against Mr. E. K. Joyce, charging him with selling self-raising flour, which was certified by Dr. Angell, the public analyst, to contain 1 per cent. of alum, or an equivalent preparation containing aluminum equal to 70 gr. per 1 lb. of flour, and that, in his opinion, was a form of adulteration calculated to be injurious to health. The certificate was dated July 13, and upon it the Food and Drugs Committee of the Town Council felt bound to institute a prosecution. On the day on which the case was to be taken, Dr. Angell telegraphed, "Please withdraw the case. Certificate should read phosphates of lime and alumina." As the analyst's certificate was made worthless, the case was struck out. Mr. Joyce, in the meantime, had had a sample analysed by Dr. Bernard Dyer, who certified that the sample of flour was free from alum. The Food and Drugs Committee, under these circumstances, had felt it their duty to probe the matter further, and had directed that the third sample, held by the inspector, should be sent to Somerset House for analysis, and from there the following certificate was received:—

Government Laboratory, Somerset House.

The sample of self-raising flour, marked No. 11, was received here on the 8th instant, securely sealed. We hereby certify that we have analysed the same, and we declare that the sample in question is free from alum, that it contains only traces of phosphate of alumina, not greater in amount than

is found in genuine flour, and that not more phosphate of lime is present than is usual in self-raising flour of this description.

As witness our hands this 21st day of August, 1895.

T. E. THORPE, and JAMES CAMERON.

The Food and Drugs Committee, having received this last-mentioned certificate, which was identically the same as that of Dr. Dyer's, felt that it was due to the defendant, to the Bench, and to the public to give equal publicity to the facts which he had stated as had been given to the charge, and on behalf of the committee he expressed regret that Mr. Joyce had been put to the trouble and anxiety of a prosecution. The committee were determined to thoroughly investigate the circumstances, and he hoped that Dr. Angell would satisfactorily account for his contradictory certificates.

HARDLY VINEGAR AT ALL.

At the Swansea Police Court, on Monday, William Tovey, of Landore, was summoned, under the Food and Drugs Act, for selling adulterated vinegar. In the course of the evidence it was stated that the vinegar was sold as "Distilled Wood Vinegar." The Borough Analyst stated that although the vinegar was far from pure, and was hardly vinegar at all, yet it would come within the description on the label. The Bench dismissed the case.

AN UNQUALIFIED VET.

JOHN FUDGE, of Wincanton, was summoned at Wincanton Police Court, on August 28, for having unlawfully used the title of veterinary practitioner. Mr. T. D. Shaw prosecuted on behalf of the Royal College of Veterinary Surgeons, and Mr. J. T. Davies defended.

Mr. Shaw stated that defendant's name was not to be found in the authorised list of veterinary surgeons.

Inspector Greenwell, R.S.P.C.A., stated that defendant was witness in a case of cruelty, and defendant in his evidence stated that he was a veterinary practitioner. He had never seen Mr. Fudge's signboard or cards, and all he knew was that he treated animals in the district.

For the defence, Mr. Davies said that the case was somewhat of a harsh character. His client had never held out to the public by sign or anything else that he was a veterinary practitioner. He suggested that his client in his evidence stated that he was an unqualified veterinary practitioner, but that the prefix had not been heard.

The Chairman said the case ought never to have been brought into court. The evidence clearly stated that Fudge did say he was a veterinary practitioner, and he said so in a public place. He had used the title, and it had been circulated in the papers. They thought there was no intention to deceive the public; but he was responsible for what he said in court, and he would be fined 1s., each party to pay their own costs.

AN ACCOUNT REQUIRED.

At the August sitting of the Blackburn County Court, before his Honour Judge Coventry, Mr. J. T. A. Walker, analytical chemist, brought an action against Mr. G. W. Stones, solicitor, and the proprietor of chemical-works at Livesey, for defendant to furnish plaintiff with an account of the profits of the business from January 28 last to the end of March. Mr. J. W. Carter, solicitor, appeared for plaintiff, and Mr. R. Riley for defendant.

It appeared that plaintiff and defendant agreed that in consideration of certain work which the former did in connection with the business he should receive 10 per cent of the profits. The business was expected to clear 4,000l. the next twelve months.

Defendant was ordered to furnish the account.

HE IS TOO CLEVER.

ON Wednesday, in the City of London Court, before Mr. Commissioner Kerr, the case of S. Maw, Son & Thompson v. Street was heard. The plaintiffs sought to recover the sum of 1l. 17s. 6d. for certain druggists' goods supplied to the defendant, Mr. H. Street, of the Provident

Dispensary, Streatham. Mr. G. Thompson, plaintiffs' solicitor, said the claim was an ordinary one for goods sold and delivered. The defendant's representative asked to have the case postponed for a short time as the defendant was not then present in Court. Owing to a sudden death in Streatham he had been unable to come away, as he intended, in time. Mr. Thompson opposed the postponement of the case. The defendant, he said, had written to the plaintiffs saying that he was sorry he had not sent on their small account, and he would do so as soon as possible. The defendant's representative: He did not tell me that. Mr. Commissioner Kerr: Probably not. He is too clever. He only tells you a bit of the story. There must be judgment for the plaintiffs. If the defendant has any defence he must apply for a new trial.

A BUSINESS ON RAMSGATE SANDS.

BEFORE Mr. Commissioner Kerr, at the City of London Court, on Saturday last, Thomas Hodgkinson, Prestons & King sued Mr. A. Gold, lately trading as J. & A. Gold, in Cable Street, Whitechapel, to recover the sum of 13l. 18s.

Mr. Moore, who appeared for the defendant, objected to the case proceeding, as he maintained the summons had not been properly served, but upon his brother, Harry Gold, who was on Ramsgate Sands at the time.

Mr. Oakley, a traveller to the plaintiffs, swore that he served Alfred Gold with the summons, and the Commissioner decided to hear evidence as to the defendant's means.

Alfred Gold thereupon said that it was impossible for him to pay the debt. His business was on Ramsgate sands, and consisted in the sale of French nougat.

Mr. Aldous pointed out that the goods were supplied to the defendant at Whitechapel, but they were afterwards removed.

The learned Commissioner said it seemed to him to be a very suspicious transaction altogether. Defendant admitted going about from Ramsgate to London, and he must have money somewhere to be able to do that. He would be committed for forty days.

Bankruptcy Reports.

Re JOSEPH PITMAN ALCOCK, Bromsgrove, Chemist and Druggist.

THIS debtor underwent his public examination at the August sitting of the Worcester Bankruptcy Court. Particulars of the liabilities and assets have already appeared in the *C & D*. Owing to the accounts not being ready the examination was adjourned.

Re HENRY BOORMAN, Bainbridge, 60 Pratt Street, Camden Town, and elsewhere, Manufacturing Chemist.

THE first meeting of creditors was held on Wednesday, at the London Bankruptcy Court, before Mr. Egerton S. Grey, Assistant Receiver. Mr. Haworth attended on behalf of creditors, and Mr. Kimber (H. D. Kimber & Co.) represented the debtor.

The accounts filed show unsecured debts, 804l. 4s. 7d.; fully-secured debts, 963l. 14s., the securities being valued at the same amount; preference claims, 42l. 19s.; and assets, 275l. The latter item consists of stock, costing 650l., and estimated to produce 250l.; fixtures, 10l.; and furniture, 15l. The business was commenced in November, 1894, by Mr. Ebenezer Cox, and consisted of the manufacture of chemical preparations, at Pratt Street, Camden Town. During the following February the debtor joined Mr. Cox in partnership, and introduced a capital of 250l. It was then represented that the liabilities only exceeded the assets by 36l., and that, with the aid of further capital, the business would yield a large profit. That anticipation, however, was not realised; and, with a view to increasing the business, the firm in March, 1895, took a shop at 88 Queen Street, Cheapside, and in May one at 38 Aldersgate Street, which were carried on as "The Hygienic Co-operative Stores." These shops were originally conducted at a profit, but the debtor alleges that they were crippled by the reckless manner of conducting them by his late partner. In June last the

debtor instituted an action in the Chancery Division, with a view to obtaining a dissolution of the partnership, and the Court appointed Mr. Herbert Lovely, of 38 Aldersgate Street, E.C., as Receiver. Immediately afterwards the partnership was dissolved by mutual consent, the debtor taking over all liabilities and assets. He further agreed to pay 100% to his late partner, and paid 75% in cash and a promissory note for 25%. Since then he has continued to trade as before. A private meeting of the creditors was held on July 11. An offer was made to pay a composition of 7s. 6d. in the pound; but before this was accepted an execution was levied by a creditor, with the result that the debtor eventually filed his petition.

The Chairman stated that the debtor had lodged a proposal to pay a composition of 7s. 6d. in the pound in cash to the creditors. Under these circumstances the better plan would be to adjourn the meeting to enable the terms of the arrangement to be printed and circulated amongst the creditors. And eventually a resolution was unanimously passed for the meeting to be adjourned for a fortnight, with a view to the offer being placed before the whole of the creditors.

The public examination is fixed for October 1.

The following are the principal creditors, viz.—

Unsecured.

	£	s.	d.
Allard & Co., Bishopsgate Street, E.C.	33 11 4
Barrett & Power, 8 Bow Lane, E.C.	10 12 0
Cook, E., & Co., Bow	30 1 3
Cox, E., Chiswick	22 10 0
Fell & Briant, Glasshouse Yard, E.C.	25 7 9
Gilbert, J., Anerley	14 19 3
Gibson, R., & Co., Glasshouse Yard, E.C.	19 0 1
Grant, H. & Co. (Limited), Bermondsey	12 7 8
Grindley & Co., Poplar	39 19 7
Johnson & Jørgensen, Eastcheap, E.C.	40 14 6
Lever, J., Fulham	48 7
Maw, Son & Thompson, Aldersgate Street, E.C.	35 3 8
Patent Stopper Box Company, Victoria Street, S.W.	67 10 10
Punt, E., & Co., 55 Jewin Street, E.C.	56 15 9
Robinson & Sons (Limited), Chesterfield	17 14 9
Schutze, F., & Co., Aldersgate Street, E.C.	42 8 7
Windschluagl, C., & Co., Leadenhall Street, E.C.	12 18 7
Wright, N., Fulham	55 0 0
Watson & Wates, Leadenhall Street, E.C.	17 5 3

Fully-Secured.

Barlow, H., Ryde	..	..	75 0 0
Black, Mrs., c/o Mr. Gordon Black, 1 Mitre Court, Fleet Street, E.C.	..	..	18 4
Civil Service Mutual Furnishing Company, 15 Charterhouse Street, E.C.	..	..	101 8 0
Haworth, R. N., 14 Farnival's Inn, Holborn	..	..	94 2 0
Hedges, Mrs., c/o Messrs. Wainwright & Co., Staple Inn, W.C.	..	..	650 0 0
Priest, H., 14 Farnival's Inn, Holborn	..	..	25 0 0

Preference.

Brown, R., Pratt Street, Camden Town	..	..	13 15 0
Gliddon, A. J. L., 91 Queen Street, E.C.	..	..	55 0 0

Re MARY ANN HILLOCK, widow, 146 Southampton Row, Russell Square, W.C., trading as the Medical Electrode Company.

THIS debtor presented her own petition at the London Bankruptcy Court last Monday, when the usual receiving order was made against her estate. At present the stock in debtor's premises is valued at 5% only, and the debtor has no assets of her own. The amount of the liabilities was not stated.

EDISON thinks that it may be argon which attacks the filaments of incandescent electric lamps.

HAMPSTEAD DRUGS ARE PURE.—Mr. Alfred W. Stokes, F.C.S., F.I.C., public analyst for Hampstead, in his report for the first quarter of the year, says that he examined twenty-four samples of drugs of very diverse nature, and they were entirely free from adulteration, and of high quality.

Gazette.

PARTNERSHIPS DISSOLVED.

Biddiscombe, C., and Rowland, J. L., chemists and druggists, Park Terrace and Station Parade, Willesden Green, N.W., under the style of Biddiscombe & Rowland.

Clough, J., and Campbell, A., veterinary surgeons and shoemiths, Liverpool, under the style of Clough, Campbell & Co.

Jarvis, H., and Bankes, V. A., veterinary surgeons, Battle, Burwash, and St. Leonard's-on-Sea, under the style of Jarvis & Bankes.

Matthews, G. F., and Lonsdale, B., drysalters, chemists and druggists, and glass, oil, and colour merchants, Bristol, under the style of Henry Matthews & Co.

RECEIVING ORDERS

Berlyn, Abraham, Edghaston, Birmingham, and Stratford-on-Avon, dental surgeon.

Jones, Henry A., Chester Street, St. George's, Hanover Square, W., horse-dealer, and Kirk, William, Upper Bedford Place, Bloomsbury, W.C., veterinary surgeon, now or late carrying on business in partnership at Chester Street, aforesaid, now or late carrying on business in partnership as jobmasters and horse-dealers.

ADJUDICATION.

Collier, Charles Churchill, Gamlingay, Cambridgeshire, druggist.

Business Changes.

MR. R. W. HOUFE, of Lincoln, has sold his business to Mr. George Coverdale, of York.

MR. WILLIAM GILES, chemist and druggist, Wallsend, has taken over Mr. Ward's business in that town.

THE Chemische Fabrik of Hamburg, announce that their business has been transferred to Mr. Ludwig Kern, Gothen strasse, 35/43, Hamburg.

MR. SOL. TAYLOR, who has recently been appointed the representative in London for Messrs. Duncan, Flockhart & Co., of Edinburgh, may be addressed at 62 Colfe Road, Forest Hill, S.E.

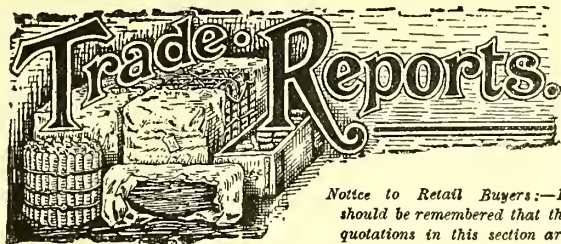
THE firm of Messrs. John Young & Son, chemists, 116 and 118 High Street, Elgin, N.B., of which John Young and William Ferguson Young are the sole partners, has been mutually dissolved, and the business is to be carried on by Mr. John Young.

MESSRS. P. MACFADYEN & Co., of Winchester House, E.C., bankers and merchants, have appointed Mr. Richard Hopf to be manager of their Mexican Department, in succession to Mr. Carlos Wehner, deceased. Mr. Hopf's own firm will therefore cease to exist, and his present business will be carried on from the Mexican Department of the firm with whom he is now associated.

THE street improvements which have been carried out at Dover have led to the opening of two new chemists' establishments in the town. Messrs. Bishop & Co., of Folkestone, have taken one of the fine new shops in Cannon Street, which they have opened as a drug-store, while in Woolcomber Street, Messrs. Waddy & Co. have taken commanding corner-premises which are known as the Marine Pharmacy.

MR. HENRY LESTER, chemist and druggist, of Nuneaton, has just completed extensive alterations on his premises, giving up the residential part of the house, so that the whole building is now devoted to business purposes. The shop now covers the entire ground floor, and has been refitted throughout in modern style by Messrs. S. Maw, Son, & Thompson, Aldersgate Street, E.C.

MESSRS. DUBOÉ-DAUSSE & BOULANGER, proprietors of the manufactory of pharmaceutical extracts of Dausse-Ainé, Rue Aubriot 4, Paris, announce the retirement from the firm of M. Duboé-Dausse. The business will be continued by the remaining partner, M. Boulanger Père, together with Messrs. Emile Boulanger-Dausse, Ragoucy, and Cocâtre, who are all qualified pharmaciens, and related by blood to the old proprietor, whose father-in-law established the business in 1834.



Notice to Retail Buyers:—It should be remembered that the quotations in this section are invariably the lowest net cash prices actually paid for large

quantities in bulk. In many cases allowances have to be added before ordinary prices can be ascertained. Frequently goods must be picked and sorted to suit the demands of the retail trade, causing much labour and the accumulation of rejections, not all of which are suitable even for manufacturing purposes.

It should also be recollected that for many articles the range of quality is very wide.

42 CANNON STREET, E. C., September 5.

CONSIDERING the time of the year, business in the drug and chemical markets is fairly brisk, and in several important articles there have been large transactions at higher prices since last week. In fine chemicals the most noteworthy feature is the advance in *Cream of tartar* and in *Tartaric acid*. *Camphor* is for the moment unchanged, but the wild speculation which seems to have taken possession of the raw article may possibly soon react upon the refined drug. *Cocaine* keeps steady, *Morphia* shows a somewhat firmer tendency, and *Permanganate of potash* has been raised in price. *Pilocarpine* is also higher. *Magnesium metal* has been reduced in price. *Quinine* dull, and tending easier. Several of the *Heavy chemicals* are quoted higher as a result of the agreement between the British alkali-makers, under which competition will, to some degree, be put an end to between them. *Carbolic acid* is firmly held, *Sulphate of ammonia* easier. The chief feature of interest in the drug market is the big jump in *Camphor*, but whether this rests upon a genuine basis remains to be seen. Chinese oils (*Cassia* and *Star anise*) are still being cornered, and advance day by day. *Opium* is active and firmer, owing to advices from Smyrna. For genuine *Kino gum* a fabulous price is said to have been paid. At to-day's drug auctions, which showed a fairly satisfactory tone, *Cape aloes* was firm to dearer, *Zanzibar aloes* much lower, *Cardamoms* showed an improvement, and for new *Tinnevely senna* very high prices were paid. *Cassia fistula* sells readily, but *Cascarilla*, though still high in price, shows signs of falling. *Benzoin*, of good quality, sold at full rates, but other gums—notably *Myrrh*, *Gamboge* and *Dragon's blood* were neglected. Fine *Vanilla* is again somewhat dearer. There has been an improved demand for *Cod-liver oil*; *Cardamoms* show steadier prices; oil of *Cinnamon leaf* is higher. *Honey*, *Ergot-of-rye* and *Calumba* are neglected. *Menthol* is easier; *Cubeb*s much lower. New *Orris root* has sold at fairly steady prices. *Ipocacuanha* quiet. *Drysalteries* show little change. *Turkish and Chinese galls* are firmer, *Beeswax* quiet, *Shellac* somewhat dearer. In the spice market we have to report very few alterations. *Ginger* has again improved, rough *Cochin kinds* being about 1s. per cwt. dearer at auction. *Nutmegs* and *Mace* keep quiet. In *Capsicums*, *Chillies* and *Pimento* there is little doing, and *Pepper* is also quiet. *Pearl tapioca* has declined. Sales of *Cinnamon* have been made, to arrive, at lower prices. *Zanzibar Cloves* showed a fractional improvement a few days ago, but have since again become dull. The oil market is dull and generally easier, *Linseed oil* being about 4½d. lower, *Rape oil* unchanged, while *Cotton-seed oil* is just a fraction dearer, and *Cocoanut oil* keeps very firm indeed. *Tur-*

pentine is 1½d. higher on the week, American being now quoted at 20s. 4½d., while *Petroleum* remains unaltered at 5½d. for ordinary American, and 5½d. for Russian. The price of silver has kept very steady, bars being quoted to-day at 30½d. per oz. The Bank-rate still keeps at its long unchanged figure of 2 per cent.

THE August shipments of cinchona-bark from Java, according to telegraphic information from that island, amounted to 697,000 half-kilos. The total shipments for the first eight months of the year were 6,013,700 half-kilos. The following are the figures for the last five years from July 1 to June 30:—

Year	1894-5	1893-4	1892-3	1891-2	1890-1
Half-kilos. ..	8,705,657	7,428,336	7,955,090	7,786,867	6,876,816

THE weather in the flower-farming districts of Southern France has been exceedingly hot lately, and numbers of young plants are withering under the scorching sun and in consequence of the want of rain. The violet-plantations in particular are showing signs of injury, and unless abundant rains should fall this month the prospect is that the next crop will be damaged beyond repair. The jasmine-harvest is now in full swing, favoured by excellent climatic conditions; but the stocks held over from last season are so large, and the demand has been so slack, that the producers have the utmost difficulty in finding buyers for their wares. The tuberose-crop, which was expected to be insignificant, is turning out better than could have been anticipated. Though the price has not yet been fixed, it is likely to be fairly remunerative to the growers. The olive trees, having received plentiful supplies of water in the winter and early spring, are able to support the present heat without injury. They look excellent, and, up to the present, show no trace of insect-pest.

MESSRS. W. J. BUSH & Co. write: "Last week we made our trial stills of peppermint oil, and in a few days hope to be in full swing. The first deliveries of new oil should therefore be ready in about a fortnight or three weeks' time. The severe and prolonged winter made the roots of the peppermint-plant very late in shooting, and instead of warm spring rains, dry hot weather set in and seriously retarded the growth. The consequence was that no new ground worth mentioning could be planted, and some of the old fields failed altogether. The outlook in June and the earliest part of July was indeed alarming, and consequently prices for the oil were rushed up to their present figures. Had not rain fallen abundantly and continuously during the middle part of July until the first fortnight in August, there is no doubt 40s. or 50s. would have been willingly paid for the oil; but this opportune change modified considerably the serious aspect. The herb soon started into healthy and vigorous growth, and has been growing ever since, so that farmers are now loath to cut, although the time has come for them to do so, and there will be little gained if the herb is allowed to stand longer. The yield of oil from our trial stills is very fair, and, provided warm, open weather continues during the cutting, the oil will run slightly above the average in yield, and will be of magnificent quality. In our opinion prices cannot, or ought not, to go below present market quotations, but should be fully maintained, with a rising tendency. The point we wish to impress on the trade is that there is no "famine" or "disaster," in the proper sense of the words, and such as has occurred to lavender; otherwise the price would be 50s. or 60s. At the same time it must not be overlooked that the total produce will be much below the average, and there will be a genuine deficiency. We cannot yet fix definite prices, but hope to do so in a few days."

THE Government statistics of the importation of jalap into the United States during the past five fiscal years are interesting (says the *O. P. & D. Reporter*). In 1890-1891 the importation amounted to 92,107 lbs., valued at \$24,141, and the import cost per lb. averaged 26c. The following fiscal year there was an increase in the importation to 112,601 lbs.,

the value of which was \$24,017, a slight falling off from that of the year before. The average import cost per lb. declined to 21c. In 1892-1893 the importation ran up to 144,057 lbs., valued at \$26,487, and the import cost declined to 18c. per lb. In 1893-1894 there was a slight falling off to 131,410 lbs., valued at \$22,933, with a further decline in the import cost per lb. to 17½c., an evidence that the importation of the year 1892-1893 was more than sufficient for the requirements of the country for a single year. In the year which closed June 30, 139,066 lbs. were imported, valued at \$25,386, and a trifle over 18c. per lb. import cost. The question is whether there will be a material advance in the market price before the heavy arrivals of the new crop, about six months hence. Judging from the general condition of affairs in Mexico, and the importations for the past five years, there is no reason for anticipating any falling off in the shipments. The average yearly receipts for the period under review were 123,848 lbs. As the importation of 1890-1891 was comparatively light, the average for the past four years will enable a clearer understanding of the situation to be obtained. It was 131,783 lbs., which may with safety be accepted as the yearly consumption of this country. That being the case there is no reason for anticipating materially higher prices.

ACACIA.—*Soudan* sorts are firmly held, but at auction no sales were effected. A parcel of good hard glassy sorts from Suez is held for 52s 6d. per cwt., and another one of 82 bales of good quality was bought in without mention of price. Sixteen cases hard *picked* Trieste gum were also offered and bought in, yellow to grey drop at from 6l. 10s. to 7l. For small yellow siftings a bid of 35s. per cwt. was refused. A lot of 8 bales nondescript common drop and dust sold at 3s. 6d. per cwt., subject to paying charges. Privately fine *Soudan* sorts have been sold up to 62s. 6d. per cwt. Arrivals of some importance are shortly expected.

ACID (CITRIC).—In very good demand, but, up to the present, without change in price—1s. 1½d. to 1s. 1¾d. per lb.

ACID (TARTARIC).—Very much firmer. The English manufacturers have twice raised their quotations since our last reports, and refuse to-day to sell anything below 1s. per lb. Foreign, 11¾d. per lb.

ACONITE.—Ten bags small Japanese root were bought in to-day at 22s 6d. per cwt. Market neglected.

ALOEES.—*Cape*: 30 packages were offered, all of which sold with good competition at an advance of about 6d. per cwt. Good bright hard quality realised 24s to 24s. 6d., slightly drossy mixed from 23s. to 24s., and soft dull from 19s. 6d. down to 19s. per cwt. *Curaçao* aloes poorly represented. Of 62 packages 30 sold at 15s per cwt. for dark caky, and from 8s. down to 4s per cwt. for very common overbeated. There has lately been a fresh arrival of *East Indian* aloes, which was offered in sale to-day, and partly sold at very low rates. *Zanzibar* (from Aden), in skins, fair aroma, but very soft, realised 34s. to 41s. For a parcel of thin bright treacly aloes in tins an offer of 23s. was refused; the owner suggested 28s as the price. The market is decidedly flat. Another parcel of 67 kegs *Socotrine* aloes is limited at 65s per cwt. for fair brown but soft, but a bid of 60s. would be submitted; it was not forthcoming, however.

BALSAMS.—The market is unchanged for all varieties. A cask of good bright *Canada* balsam was bought in at 1s. 5½d. Of *Copaiba*, 3 casks good bright *Maranham* were bought in at 1s 8d., and another lot of thick and cloudy balsam, imported *via* Hamburg, was taken out. For 5 cases balsam *Tolu* 1s 6d. per lb. is asked, and four packages good *Peru* balsam, direct import from Central America, were bought in at 8s. 6d. per lb.

BENZON.—Unchanged. *Siam* was in large supply to-day, no fewer than 36 cases being shown, of which only 4 were sold, mostly without reserve. Small to medium pale almondy partly blocky at from 13l. 7s. 6d. to 13l. 17s. 6d., small almondy and siftings at 7l. 7s. 6d., the latter being a high price. Of 114 bags *Palembang* 25 of medium quality realised 24s per cwt. Good brown almondy mass was bought in at 45s., a bid of 35s being refused. For almondy *Siam* in hard block, 11l. 5s. was refused, the price being 12l. *Penang*

berzoin neglected, ordinary glassy seconds being bought in at 42s. 6d. Good qualities of *Sumatra* gum remain very scarce and have been sold lately by private treaty at full prices, viz., 8l. 10s per cwt. for fine seconds, pale almondy centres fairly well packed. At to-day's auctions a parcel of this variety was competed for and realised from 8l. 10s to 8l. 12s. 6d. per cwt., showing full to higher values. Ordinary kinds were neglected, fair pale almondy seconds, partly false packed selling at 6l. 10s. to 7l., ditto, more false packed at 6l. 15s. down to 5s. 10s., and very common dark thirds at 5l. 2s. 6d. per cwt.

BORAX has been in much better demand recently. The quotations by the Convention manufacturers have not changed, but the outside makers appear to have come to some understanding with regard to the minimum price, and now ask 19s. 6d. for crystals and 20s. 6d. for powder.

BUCHU.—Round leaves are somewhat dearer, 10 bales, out of 24 offered, selling at from 3d. to 3¾d. for fair greenish, partly yellow mixed. Fair green round leaves were held for 5½d., a bid of 4d. being rejected.

CALUMBA.—Altogether out of favour. A few odd lots were shown, and a bid of 9s. per cwt. was refused for ordinary, rather small, root.

CAMPHOR (CRUDE).—At auction to-day 41 parcels were offered, they included 237 packages *Formosa* camphor, mostly of recent import, for one of which a bid of 160s. per cwt. was rejected. These were all taken out at high prices. Sixty-four tubs Japanese camphor, of new import, were also placed in the sale, and 10 of them were apparently sold at 200s. per cwt. The remainder was bought in. The camphor-market again shows a strong advance, and the sales since our last report are computed at about 1,700 piculs of *Japanese*, ranging in price from 182s. 6d. to 200s., and even, it is said, to 210s., c.i.f. terms, for June-August shipment, and 600 piculs *Formosa* at from 170s. to 200s. per cwt., c.i.f. terms. For the moment the syndicate party seem to have it all their own way, and it is even said that the Japanese Government are actively supporting the ring. The syndicate, meanwhile, seem to anticipate much higher quotations still, and refuse to sell excepting to *bona fide* consumers.

CAMPHOR (REFINED).—Very firmly held. Refiners' prices are nominally unchanged to-day, and at auction a bid of 1s. 8½d. was refused for 2 casks of German bells.

CANELLA ALBA.—Six packages small pale broken quill changed hands to-day at 24s. 6d. per cwt.

CANTHARIDES.—Two casks rather dusty *Russian* flies sold cheaply, without reserve, at 2s. per lb., and a parcel of 10 cases *Chinese* was bought in at 1s. 2d. per lb.

CARDAMOMS.—The supply at to-day's auctions was unusually small, only about 100 packages, the bulk of which sold, with good competition, at rather firmer prices—viz., *Ceylon-Mysore*, medium to bold pale heavy, 2s. 7d. to 2s. 9d.; small to medium ditto, 2s. 1d. to 2s. 5d.; small, 1s. 9d. to 2s.; medium fair yellow, 1s. 7d.; and dull, partly split, mixed sizes, 1s. 4d. per lb.

CASCABILLA still sells readily, though at lower rates. Of 77 packages 47 found buyers at from 40s. to 44s. for bright silvery mixed quill, and from 23s. 6d. to 29s. 6d. for small partly silvery quill and siftings.

CASSIA FISTULA.—In good demand, although ordinary qualities only realise very low prices; 156 bags were sold to-day. Good *West Indian* of recent import at 18s. 6d. (subject) to 19s per cwt., ordinary wormy *East Indian* (*via* Hamburg) at from 9s. 6d. down to 7s. 6d., fair ditto 14s. 6d. per cwt.

CASTORUM is getting very scarce, and advancing rapidly. At auction 53 lbs were offered, and bought in at 90s. per lb. for somewhat damp seconds and thirds, mixed. For a lot of seconds, 70s. per lb. was said to have been refused privately.

CINCHONA.—A recently imported parcel of 43 serons *Huanaco* from Peru was offered. Forty-one packages sold at from 5½d. for ordinary broken up to 7¾d. for fair grey quill, and from 5½d. to 6¾d. for damages. Damaged mixed *Lora* bark realised 8d per lb. A parcel of 60 bales flat cultivated *Calisaya* was bought in at 1s. 2d. for sound quality, while damages sold at from 2d. to 3d. per lb. Sound but

rather dark bold *Cathargena* and split quill realised 9d. per lb.

COLOCYNTH.—Good Turkish apple is becoming very scarce, and only a few cases are left. Two of these, imported *via* Hamburg, of good appearance, were placed in sale, but they were held for 2s. 3s. per lb.

CREAM OF TARTAR has continued to advance all through the week. Supplies are very small, and the demand is strong. 85s. per cwt. has been paid for powder on the spot, while crystals are quoted at 83s. to 83s. 6d. per cwt. The following figures refer to the exports from Spain of tartar materials in the periods of seven months from January 1 to July 31:—

	1893		1894		1895	
	Kilos.	Pesetas	Kilos.	Pesetas	Kilos.	Pesetas
Crude tartar and wine lees	—	—	—	—	—	—
(a) to France	3,471,177	3,748,271	3,107,392	1,677,992	3,245,505	1,752,573
(b) other countries	557,275	601,856	952,175	514,475	1,398,151	755,002
Total ..	4,028,452	4,350,127	4,059,567	2,192,467	4,643,657	2,507,575
Cream of tartar	381,223	766,258	433,451	650,176	514,083	771,124

CUBEBS.—This drug, which has long been in a water-logged condition, suffered another heavy decline to-day, 29 bags of genuine small berries from Singapore, free from stalk but very mouldy, selling without reserve at from 21s. to 24s. per cwt. For another—stalky—lot 25s. is said to be the price, while 32s. 6d. was asked for a fair sifted parcel. The very heavy supply of 223 bags was offered, but the parcel referred to was the only one sold. There is every prospect of a further decline, as the Singapore statistics show an enormous increase in exports, especially to America. In the first seven months of this year 2,260 piculs have been shipped to the States from Singapore, against 636 piculs in 1894. The following figures relate to the number of piculs (133½ lbs.) exported from Java during the last five years (July 1–June 30):—

1894–5	1893–4	1892–3	1891–2	1890–91
5,093	3,946	3,244	2,207	1,373

CUMIN SEED.—New Maltese is reported to be dearer. At auction 22 packages were shown, but they were held at 36s. per cwt.

DRAGON'S BLOOD.—At auction to-day 35 cases were offered, and all bought in. Good gum, in reed, from Shanghai, at 12l. per cwt., which is rather a high price. Good to fine bright seedy lump, from Singapore, at 9l. 10s. to 10l. 10s.; and fair to ordinary dark ditto at from 9l. to 6l. 5s.

ERGOT OF RYE.—Neglected. No information is yet to hand with regard to the Spanish crop, but it is generally said to be small. At auction to-day 7 bags very wormy mixed ergot were bought in at 8d. per lb.

GALLS.—In spite of the reports that the Persian crop is a complete failure, no inquiry exists in this market. Blue galls are quoted nominally at 47s. to 48s.; green at 40s. to 42s. 6d., and white at from 34s. to 37s. 6d. The two last-named varieties are exceedingly scarce. At auction to-day 12 bales green galls from Bombay realised 42s. per cwt. Chinese galls are firmer; 58s. per cwt. was recently paid on the spot.

GAMBOGE.—Dull of sale. Of 27 cases offered to-day only 3 found buyers at 8l. 2s. 6d. per cwt. for good pickings and broken pipe of somewhat dark fracture. Picked pipe of good fracture is held for 10l. 5s. per cwt.

GLYCERINE, although reported to be very firm, is still offering (in second hand) at 50s. per cwt. for double-distilled s.g. 1.260.

HONEY.—All kinds were neglected at auction. The principal supplies to-day consisted of *Australian* of ordinary quality, and fair to good candied and liquid brown was bought in at from 23s. to 29.; liquid dark at 15s. per cwt. Of *Californian* honey, a 20-case parcel of candied yellow was shown, and was held for 42s. 6d. per cwt. Of *Jamaica* nothing of importance was offered.

IPECACUANHA.—The holders are mostly very firm, and do not seem to care to force sales. On the other hand there is an almost complete absence of demand for *Brazilian* (Rio) at the present prices. At auction to-day 58 packages of this variety were offered, but only 2 sold at 5s. for rather ordinary woody mixed, and 5s. 9d. for fine stout; good picked root was bought in at 7s. per lb. Of *Colombian* (*Cartagena*) 18 bags were shown, of which 2 sold at 4s. 2d. per lb. for fair partly stout root and grey mixed, somewhat damaged.

JALAP.—A parcel of 10 bags rather small to fair heavy mixed *Vera Cruz* sold to-day at somewhat easier prices, viz. 8½d. to 9d. per lb. Another lot of 9 packages good heavy *Vera Cruz* is held for 10½d.

JUNIPER-BERRIES offer, according to quantity, at from 6s. 3d. to 6s. 9d. per cwt., c.i.f. terms. This applies to new-crop fruit.

KINO.—Supplies of genuine *East Indian* kino are now practically exhausted, but we understand that in the course of the last few days about 60 lbs. of this variety have been sold privately in small lots at the enormous price of 15s. per lb. One of the brokers still offers three 20 lb. boxes of genuine kino, very much mixed with wood, for which he thinks that, under the circumstances he ought to make about 12s. per lb. Another parcel of gum, said to be genuine, but of peculiar appearance, has been sold, we hear at 3s. 6d. per lb. At auction 5 cases of an astringent gum mixed with wood were bought in at 50s. per cwt.

KOLA.—In fair demand at prices which are tending rather easier. Eighty-eight packages were offered, of which 17 sold at from 7d. to 8½d. for fair to good West Indian, 5d. for mouldy and dark ditto, and at 6d. for fair broken, the latter without reserve.

LYCOPodium is reported to be a little easier, and offering at 1s. 7¾d. per lb., c.i.f. terms, for new crop.

MAGNESIUM.—Lower. Metal in bars, shavings, or fine powder is offering at 13s. 6d. per lb.; ribbon and wire at 18s. 6d. per lb.

MENTHOL.—Still tending easier, and offering in fair quality at 12s. per lb. on the spot, whereas the c.i.f. price to-day is 13s. At auction a few cases were bought in at 15s. per lb. nominally, but there were no bids at 13s. The article seems to merit some attention in its present position.

MORPHIA.—A few days ago some of the manufacturers advanced their price for the *Hydrochlorate* in powder from 3s. 10d. to 4s. per oz., but one of them, at any rate, is still prepared to sell at the lower of these two figures to-day.

MUSK.—Very slow of sale. At auction to-day the usual assortment was offered, but, as is now invariably the case, none was sold. Almost all business in this article is now transacted privately, the bulk of it being concluded by a small syndicate. Of *Tonquin* pods 10 tins of first pile were bought in at 70s. to 75s. for small to bold, fairly dry, thin blue, partly brown skinned, well trimmed. Sales of this variety are said to have been made privately at 72s. 6d. Third pile pods, rather broken, thin-skinned with under-skin, were bought in at 40s. per oz., and a parcel of 80 oz. of musk skins had to be bought in, as no bid could be obtained for it.

MYRRH remains quite neglected and may now be had at low prices. The article is quite plentiful, some 110 packages being offered to-day, of which 18 sold at from 15s. up to 28s. 6d. per cwt. for common to good packages. Fine selected myrrh was bought in at 5l. 10s., and good pale at from 65s. to 70s. per cwt.

OIL (COD-LIVER).—At auction to-day 5 "tin-lined" barrels Norwegian oil sold without reserve at 140s. per barrel. American firms are reported to be purchasing freely on the Norwegian market, and the stocks in Bergen are said to be running low.

OILS (ESSENTIAL).—Chinese oils are again much dearer, *Star-anise* having sold, since our last report, at from 7s. 6d. to 7s. 3d. on the spot (7s. 6d. is said to have been paid to-day), and up to 6s. 6d. per lb., c.i.f. terms. For *Cassia* oil 6s. 6d., c.i.f., and probably 6s. 9d., c.i.f., has been paid, and 7s., c.i.f., is asked. On the spot 7s. has been paid for 70–75 per cent. oil. *Citronella* oil dull of sale, 1s. 2d. per lb., c.i.f., being asked for drums or tins. At auction 10 cases sold at 1s. 3d. per lb. to-day. *Lemongrass* oil 1½d. per oz., on the spot. *Cinnamon-leaf* oil is dearer, 2d. per oz. having been paid, and 2½d. being asked. *Eucalyptus* oil has also been in somewhat better demand. Ten cases *Amygdalina* sold to-day at 10d. per lb. The price of *Cedar-wood* oil is said to have been raised to 1s. 3d. per lb. The new price of *Ihmsen's otto of rose* is 35s. 6d. per oz., f.o.b., not 36s. 6d., as reported last week. Messina essences continue to advance, *Bergamot* oil being particularly firm. In Cambridgeshire the distillation of essential oils began about a week ago. The area under peppermint is much below the average, but the percentage yield of oil from the herb and its quality are satisfactory. Nineteen cases oil of *Cajuput* were bought in at auction at 2s. 3d. per bottle, 10 cases of Fisher's *Citronella* oil at 3d. per oz.

OPIUM.—The London market has been fairly active this week, and the sales amount, it is said, to about 50 cases, mostly manufacturing and druggists' kinds, although other grades have also been dealt in. The London stock is said to be very low—only about 500 cases—and holders generally are very firm, although the quotations still rule much below the Smyrna parity. In the latter part of the week orders for *Soft-shipping* opium have been received and partly executed, in some instances at an advance. New *Soft-shipping* has sold, we hear, at 11s. per lb., good old *Second Druggists'* at 7s. 9d., fine *Druggists'* at 8s. to 8s. 3d., and *Manufacturing* at 7s. 6d. to 7s. 9d. per lb. It is reported that American and other speculators are buying freely in Smyrna, and that large quantities are being "put away" there for investment. *Persian* opium very firm, with a fair business and a tendency towards higher rates: 11s. 3d. to 12s. 9d. per lb. is the range of prices, according to quality.

ORRIS-ROOT.—The opening price of the new *Florentine* root has been fixed. Considerable sales have already been made on the basis of 72s. 6d. per cwt., c.i.f. terms, shipment next month, and there are further buyers at that figure. *Veronese* root offers at 55s. per cwt., c.i.f. terms.

PERMANGANATE OF POTASH.—Very firm. One of the manufacturers has advanced his price 5s., and now quotes 62s. 6d. per cwt. for small, and 67s. 6d. for large crystals in 1-cwt. lots. Secondhand holders, however, are still willing to sell small crystals at 60s. The discounts have also been abolished.

PILOCARPINE.—The only manufacturer now in the market has again raised his price for *nitrate* and *hydrochlorate* by 1s. per gramme, and now asks 9s. 6d. for both these salts. A few days ago he sold 8 oz. at 8s. 6d., and this has caused him to revise his quotation.

QUINCE-SEED.—Fine quality is still held firmly for 1s. 3d. which was the last sale price; 3 bags of more ordinary kind sold to-day at 11d. per lb.

QUININE.—Slightly easier; 5,000 oz. second-hand German bulk sold a few days ago at 13½d. per oz., and there are further sellers at that figure.

RHUBARB very slow of sale. Of 158 bags offered to-day, 20 found buyers at the following prices:—*Canton* medium to bold flat, rather rough coat; three-quarter pale grey, and quarter dark fracture, at 1s., small to medium ditto, rough coat at 11d. to 11½d., medium fair coat round, three-quarter grey fracture 10d.; flat fair coat pinky fracture, but very wormy, medium to bold 1s., small ditto 10d., small round flat ditto 9d.; very wormy small druggists' 8½d., and good round and flat pickings 8½d. per lb. *Shensi* medium to bold flat, rough coat, fair pinky grey fracture 1s. 3d., small ditto 1s. 2d. per lb.

SENNA.—The new *Tinnevely* is still arriving, but the recently-received parcels show only middling quality. At auction to-day about 470 bales were offered, nearly the whole of which sold at very full to somewhat higher prices. Medium to bold fair green, slightly specky leaves, realised from 4d. to 6d.; medium greenish, 3d. to 3½d.; small to

medium partly dull in colour, from 2½d. to 1½d., and common kinds down to 1d. per lb. Ten bales *Alexandria* pods of pale colour sold without reserve at the low price of 3d. to 3½d. per lb.

SHELLAC.—This article has been very firm throughout the week, and closes at somewhat higher rates. *Orange* TN, for September delivery, has improved from 114s., on Friday last, to 116s., while the same variety for November-January shipment has sold at 110s., c.i.f. At auction only 234 cases were offered, of which 70 sold at an advance of 1s. per cwt. on second orange; medium blocky to good realising 115s. to 119s. per cwt. *Garnet lac* went lower, OCC, out of condition, selling at 97s. to 98s. per cwt.

The Liverpool Drug-market.

Our Liverpool correspondent, writing on September 4, says that *Gums* are fairly steady, but without much business passing. *Soudan* sorts of good quality are scarce and wanted. *Brazilian* continues to move off at previous rates and in moderate quantities, the inquiry for this class showing rather more animation. *Galls* are rather neglected, *Blue* being obtainable at 42s. 6d. to 50s. per cwt. for good. *Tonca* beans are very firmly held at prices given last week for *Paras*, and *Prime Angostura* are now held for 8s. 6d. *Kola* nuts are unchanged at recent quotations. There has been more demand for *Chillies*, and 37s. 6d. is absolutely the very lowest for prime quality. *Beeswax* (*Chilian*): At auction 28 packages were offered at prices ranging from 9d. to 7l. 12s. 6d., but buyers seem to think the owner's views too high, and no business resulted. Sales, however, have been made privately in the neighbourhood of these figures. *Castor* oil continues to improve steadily in position, and *Calcutta* good seconds has been selling freely at 2½d. *Madras* and *First pressure French* are quotably higher for the week, at 2½d. to 2¾d. *Canary seed* has steadied itself, and 35s. is now demanded for spot parcels and also for forward delivery. *Chilian anise* has been selling at 22s. 6d. per cwt., 25 bags changing hands at this price. *Honey* of all grades is firmly held, notwithstanding the somewhat slow demand, holders evidently having a good opinion of the future. *Cream of tartar* has experienced a further advance during the week; 80s. has been paid for *Prime first quality*, and now 82s. 6d. is demanded. *Curaçao aloes*: 40 bags have been sold on private terms.

Newcastle-on-Tyne Chemical Market.

Our Newcastle correspondent writes, on September 4, as follows:—The main feature of interest in the market here has been the advancement of prices for *Alkali* and *Soda ash*. Seemingly the producers by the Leblanc and ammonia processes have at last come to an agreement on the matter, the result being that these products are 10s. per ton higher, and soda crystals 5s. per ton higher. *Caustic soda* and *Bleaching powder* remain unchanged. Prices now stand as follows:—*Alkali*, 52 per cent., 5l. 5s. per ton, net; *Soda ash*, 52 per cent., 4l. 10s. per ton, net; *Soda crystals*, 2l. per ton, net. *Bleaching powder* in good demand, especially for export: hardwood casks, 7l. 10s. per ton, net; softwood casks, 7l. 5s. per ton, net. *Caustic soda*, 70 per cent., steady, and ranging from 7l. 5s. to 7l. 15s. per ton, net, according to destination. In the position of *Hyposulphite of soda* there is not much change to report; demand continues at 6l. per ton, net, for 5 to 7-cwt. casks, and 6l. 15s. per ton, net, for 1-cwt. kegs in quantities. Rather higher prices are being asked for small lots. *Recovered sulphur* is in request at 3l. 17s. 6d. to 4l. per ton, net, and somewhat scarce. *Chloride of barium* has attained a firmer position, and much more business has been done than of late; and for best ordinary refined crystals, in bags, 6l. 7s. 6d. per ton, net, is being asked. *Yellow prussiate of potash* firmer, 8d. to 8½d. per lb. being now freely quoted. In *Saltcake* there is little offering, and for what there is 20s. to 22s. 6d. is easily obtained. *Chlorate of potash* dull, at 4½d.; and *Chlorate of soda* remains at 6½d. to 7d. *Sulphate of alumina* and *Blanc fixe* are in fair request at unchanged rates. *South Durham salt* sells freely at 9s. to 9s. 6d. per ton, f.o.b., Tees. *Oxalic acid* as before—3½d. per lb., any port.

In our supplement this week a corner block of property in Sunderland is advertised for sale, the chief part of which has been a pharmacy for forty years.



Memoranda for Correspondents.

In letters for publication correspondents are requested to express their views as concisely as possible.

Correspondents should write on one side of the paper only, and devote a separate piece of paper to each subject of inquiry.

The name and address of the writer should accompany all communications with, if desired, a distinctive nom-de-plume.

Apprenticeship.

SIR,—In your description of the firm with which I am connected you are good enough to refer to some remarks which I made to your representative regarding apprenticeship. The subject is one which I feel sure is uppermost in the minds of many at this time when we are approaching the beginning of another school year, and a few hundred assistants are entering the schools to get that polish which their apprenticeship has failed to give them. For that reason I venture some comments upon the subject.

It will not be considered out of place if I take for "Apprenticeship as it was," the scheme followed by Randall & Son, for so many leading pharmacists were trained here that it may be taken to represent the best training grounds. During most of the time that my firm took apprentices, the term was five years, but towards the last it was reduced to four years. Six departments of the business were arranged—(1) Front counter, where the principal serving of customers was done; (2) Dispensing private prescriptions; (3) Second counter, where most of the stock was put up, except small things; (4) Dispensing for the Public Dispensary, which was conducted on the premises for many years; (5) Third counter, which was a little less prominent than the others, and at it small stock was put up; (6) Wholesale and manufacturing. Each apprentice had nearly one year in each department, except the front counter, to which he was called when required. He began with No. 5, learning to make parcels, serve small articles, learn the names of drugs, and help generally. Apprentices were never sent on errands, except as a special favour with a bottle of medicine, a letter, or the like. After No. 5, the apprentice came to department 4, under the eye of an assistant. In the third year to the second counter, in the fourth year to private dispensing, and in the fifth year to the wholesale and making small things, with the run of the laboratory. The training was sound, thorough and practical.

"Apprenticeship as it is," frequently differs materially from the foregoing. Nowadays, parents who can give their sons a sound scholastic training, are chary about sending them to a trade in which illegitimate competition increases each year, so pharmacy is largely recruited from the lower ranks of the populace. To this may be attributed, in some degree, the want of mental capacity, and deficiency in educational training exhibited by so many who enter for the Preliminary examination. With decrease in mental capacity, there appears also to have been a decrease in the disposition of employers to teach their apprentices. A conversation which I recently had with a young man who had just completed his apprenticeship is an example of this. This young fellow's duties were—washing bottles, acting as light porter, and packing pennyworths of Epsom salts, insect-powder, small bottles of hair oil, glycerine, and castor oil, for sale to small provision dealers, occupied most of his time. He had seen a prescription, but not inside the shop; galenicals were bought, not made; in fact, he had never made a British Pharmacopœia preparation. Most of us, unfortunately, know this is not an isolated instance, and in a measure it explains why, in Dr. Stevenson's report for the year ending March, 1895, the failures in pharmacy are responsible for 22 per cent., and in practical pharmacy and dispensing nearly 17 per cent, although they are the subjects which should show the smallest proportion of failures. The more one considers the question of present day apprenticeship the more one is led to believe that in the majority of cases youths are taken either as a means of cheap labour, or for the premiums they bring. They are taught nothing syste-

matically, but allowed to learn what they will, and in what ever manner they choose. Many refuse apprentices from conscientious reasons, others whose business offers exceptional advantages, say "they are a nuisance and require watching."

Now, as to "Apprenticeship as it ought to be." The word apprentice is taken from the French verb *apprendre*, to learn, and the common meaning of the word is "one bound for a term of years to serve at some craft, or trade, under a master, who in turn binds himself to instruct him." If one examines the condition of apprenticeship existing in France, Germany, Russia, or Denmark, it is found that the system is much superior to ours. I am referring now to the training in first-class pharmacies. After many years' consideration as to how our apprentices may best be taught, a plan such as the following has frequently presented itself to me. First, the Preliminary examination should (besides the present subjects) include one modern language, elementary mechanics, algebra and Euclid, and it should be obligatory to pass it before apprenticeship. The term of apprenticeship should be four years. In such a business as my firm's, the apprentice would pass the first year at the wholesale counter; second year, in the laboratory; third year, morning in the counting-house, afternoon putting up stock; fourth year, front counter, and dispensing under a qualified assistant. At least two hours daily should be allowed for study, which may be divided as follows:—In the first year it would be advisable to devote the whole time to the British Pharmacopœia; second year, make notes daily of every preparation made, the process employed, and in the time allowed for study refer to such, using as text-books Squires's "Companion," the "Extra Pharmacopœia," Attfield's "Chemistry," Maisch's "Organic Materia Medica," and Cripps's "Galenic Pharmacy"; third year, examine all chemicals received into stock, not only for purity, but identification, as well as drugs for adulteration, taking advantage of the microscope for the latter, and using Flückiger's "Pharmacognosy" as a text-book; fourth year may be devoted to botany and subjects generally, while the evenings can be usefully employed attending science classes.

With modifications, depending upon the nature of the business, I think that this scheme would be practicable, and as a means of making the embryo-pharmacist a useful help in pharmacy, it would be an advance on the training many of our young men at present receive.

Yours, &c.,
Southampton, August 30. H. WILSON.

The Minor Examination.

SIR,—I read with interest the article in your Summer Number on the Minor Examination, and as views of things differ perhaps you will allow me to tell about my experience. In Practical Chemistry my work was set forth on the usual printed slip. It was:—

1. You are given a solution of permanganate of potassium, determine the amount in i.c.c. by means of solid $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$, and prepare 100 c.c. of a standard solution of $\text{K}_2\text{Cr}_2\text{O}_7$ having the same value as the KMnO_4 proving by experiment that it is correct.

2. Analyse qualitatively the substances contained in the pill-boxes.

The salts in the pill-boxes were ammoniated mercury and oxide of silver with calcium carb. as impurity. Candidates will do well to accustom themselves to analysing compound salts and solutions: it is the analytical ability they want to test, not merely finding B.P. impurities, but to show you know how to analyse.

Practical Pharmacy.—My work consisted of the following:—

Pil. ferri, No. 24.	
Three to be taken t.i.d.	
Make $\frac{1}{2}$ quantity of B.P. syr. ferri iodidi.	
Acid. tannic	grs. x.*
Ol. theobromæ	q.s.
Ft. Pessary. Mitte vi.	
Tinct. cannabis indicæ	3ss.
Tinct. hyoscyami	3ss.
Mucilage	3ss.
Aq. ad	3vj.
Ft. Mist.	

* The italicised words are as written by the contributor. We let them go as examples of slips which will cost candidates marks.—ED. C. & D.

These went all right. In the course of two days I received a note to attend for second day's examination.

Chemistry.—(Mr. J. E. Saul).—Zinc, give its source and mode of preparing its salts. What is the use of solution of chlorine in making zinc chloride and zinc sulphate? write equations. Give the formula of zinc carbonate, any other salt similar. Magnesium: give its source; is dolomite fairly pure? How is $MgSO_4$ prepared? How is carbonate of magnesium prepared? What is the difference between the heavy and the light? How is the oxide of magnesium prepared? Arsenic, all about it. How is arseniate of sodium prepared? What is the use of the sodium nitrate in its preparation? How is potassium bichromate made? We went carefully through this: equations were asked for. "Oxidation," "Reduction," "Isomeric," "Isomorphous"; tell me all you know about these terms.

I found Mr. Saul very pleasant; very searching in his questions, very quick to detect a little weakness, and he tackles you on your own answers, he likes precise answers; of course we know he is a strong educationalist. He told me that I had done very well, but we did not discuss the election; I think he kept me going very well all the time I was with him. He looked at his paper during the time I was trying some equations.

Materia Medica.—Mr. Druce was very pleasant. We started work, went through a lot of specimens; when you make a mistake, he gets rather sarcastic. I take him to be enthusiastic in his subject, and he lets you know about your mistakes, and I think if you keep steady, you have a chance to put errors right. The animal substances he bothered me with. I told him I was rather weak in this part, but he smiled and said, "Let me see what you do know," and we went at it. He is fairly searching; he wants to know everything about anything he shows you; but he is patient, and will give you some good hints, which I was glad of. He is not one of those men who merely mutter "Yes," when you tell him anything, and I found I knew more about many things after I left him than I did before I went to him. He told me I had satisfied him well all round, and gave me good advice about one or two things he thought I was weak in.

Pharmacy.—Mr. White started with pleasant greetings. He showed carboic acid; how is it obtained? what is it? dose; solubility. Ergotin, what is it? Tinct. opii, tinct. camph. co., ung. hydrargyri, ung. hydrarg. nit., vinum ipecac.: was asked to recognise these, and had to tell all about them. Then we went through most of the preparations of opium, strengths, doses; iodine preparations, ext. cinchon. liq., all about it; ext. nux vom., all about it; finishing up with what are a grain, minim, No. 20 sieve, doses of many of the more powerful drugs, &c. Left him, knowing I had done fairly well.

Prescription Reading.—Mr. Tanner's manner did not give me a comfortable feeling. He has not anything to say. We started work, and I went along for a short time; then he told me I could do with a little practice in prescription reading, to which I replied that I must admit I could at these specimens, which would compare favourably with Egyptian hieroglyphics; and I told him I had done considerable work in this subject, but these specimens did not represent anything that one would meet with in pharmacy generally, and, in fact, if such prescriptions did get to any pharmacy it would be necessary to hold a little conference over them. At length he told me he did not think he need examine me any further, and he ploughed me, for I saw him record his fatal blow in the form of a big round O in the corner of my paper. The President called me up and informed me of my failure, and told me a little steady reading would bring me up all right; but I said "Not in prescription reading, if that is what is given as a test of our competency." For now to be compelled to go through the mill again for this sort of thing is a little galling. We shall eventually see the report of failures in different subjects by the official visitor from the Privy Council. I have seen him come into the room where the examination is held, but have not noticed him visit respective examiners to see how they discharge their duties.

My humble opinion is that many things about the examination need attention as much as the increased stringency in the Minor. What are the examiners doing with the Major? Is that being increased correspondingly? Oh no!

I suppose they mean to force further work on the Minor and leave the Major as it is, presuming that more men will go in for the Major and so contribute to the revenue of the Society. Well, if they don't alter the Major there will not be that wide difference between the two classes of men as before. Then, perhaps, we shall hear no more about the accomplishment of the one and paucity of knowledge of the other. But if a higher qualification is to be of any value it must be conducted on the same lines as the lower one. A word about some of the examiners' views of the extent of a man's training, &c. I dare say most candidates are not prepared to know what should be the extent of their training. When a candidate is told that he is audacious in coming up for the Minor after nine months at a school, besides having done a fair amount of reading at odd times, things look a bit cloudy for the near future. After all, I expect some of the unlucky ones will have a chance before things come to a climax. When they plough Bell scholars and some of the best men the best schools boast of, we of little merit may get through with a rush sometime. So cheer up ye disconsolate ones and pay your 3*l.* 3*s.* next October.

Yours respectfully,

UNSUCCESSFUL. (115/35.)

Buisson v Pasterur.

SIR,—In view of the fearful death of the boy Benjamin Howard from hydrophobia in its worst form, after a twenty-one days' course of Pasteurian treatment, it may be as well to draw attention to the fact that Dr. Buisson's safe and simple treatment of the fell disease, by vapour bath, can be procured at nearly every hydropathic establishment in England. For certain it can be had in London, Richmond, Chester, Manchester, Southport, Hastings, Bristol, Bath, Matlock, Bournemouth, Worcester, Birmingham, and Harrogate; and I will with pleasure give full addresses of the bath-establishments in these places to anyone who may apply to me at the address below. I should add that, through the kindness of a philanthropist, needy patients will be treated in these establishments free of charge.

Believe me to be, courteously yours,

The High Elms, Nutfield, Surrey.

FRED. E. PIRKIS.

* * Replies to Correspondents will be inserted next week.

Marriages.

CRICKSHANK—FERGUSON.—At 16 Dalkeith Road, Edinburgh, on September 3, by the Rev. L. F. Armitage, William Crickshank, chemist, Fraserburgh, to Chrissie Louisa, youngest daughter of the late James Ferguson, Edinburgh.

GILMOUR—RAINFORTH.—At St. Paul's Presbyterian Church, Harrogate, on August 28, by the Rev. J. S. Cockburn, M.A., Andrew Gilmour, chemist and druggist, youngest son of the late Andrew Gilmour, pharmaceutical chemist, Burnt-island, to Maggie, fourth daughter of John Rainforth, Harrogate.

Deaths.

BAXTER.—The death has occurred, at the age of 75 years, of Mr. W. Baxter, chemist and druggist, Wisbeach. Deceased had been in business in the town for nearly half a century, and was highly respected.

COLES.—On July 16, Charles Henry Coles, chemist and druggist, Reading. Aged 75.

ISMAY.—On August 14, John G. V. Ismay, chemist and druggist, Newcastle-on-Tyne.

STEVENSON.—On August 29, at Whitby, from accidental drowning, Harold Thomas Stevenson, aged 27 years, elder son of Thomas Stevenson, M.D., F.R.C.P., of Sandhurst Lodge, Gresham Road, S.W.

THURSFIELD.—On August 17, Bevington Thursfield, chemist and druggist, Kettering. Aged 28.

WILLKOMM.—Dr. Moritz Willkomm, a botanist of renown died on August 24, at Wartenberg, Bohemia. Aged 74 years. Dr. Willkomm was especially known for his work on the Spanish flora. From 1868 to 1874 Willkomm occupied the chair of botany at Dorpat, and after that a similar position at Prague.